PETROLEUM WEEK

AUGUST 12, 1955

■ A McGRAW-HILL PUBLICATION

Credit Curbs Won't Hurt Oil Growth 9

Oil Imports Battle Flares 11

WATCH THIS CLOSELY → The Atom: New Tool for Refiners 11

Special Report on Offshore Oil—III 15

Deep-Hole Rigs Get New Power Source 21

Millions Poured into Cat Reformers 24

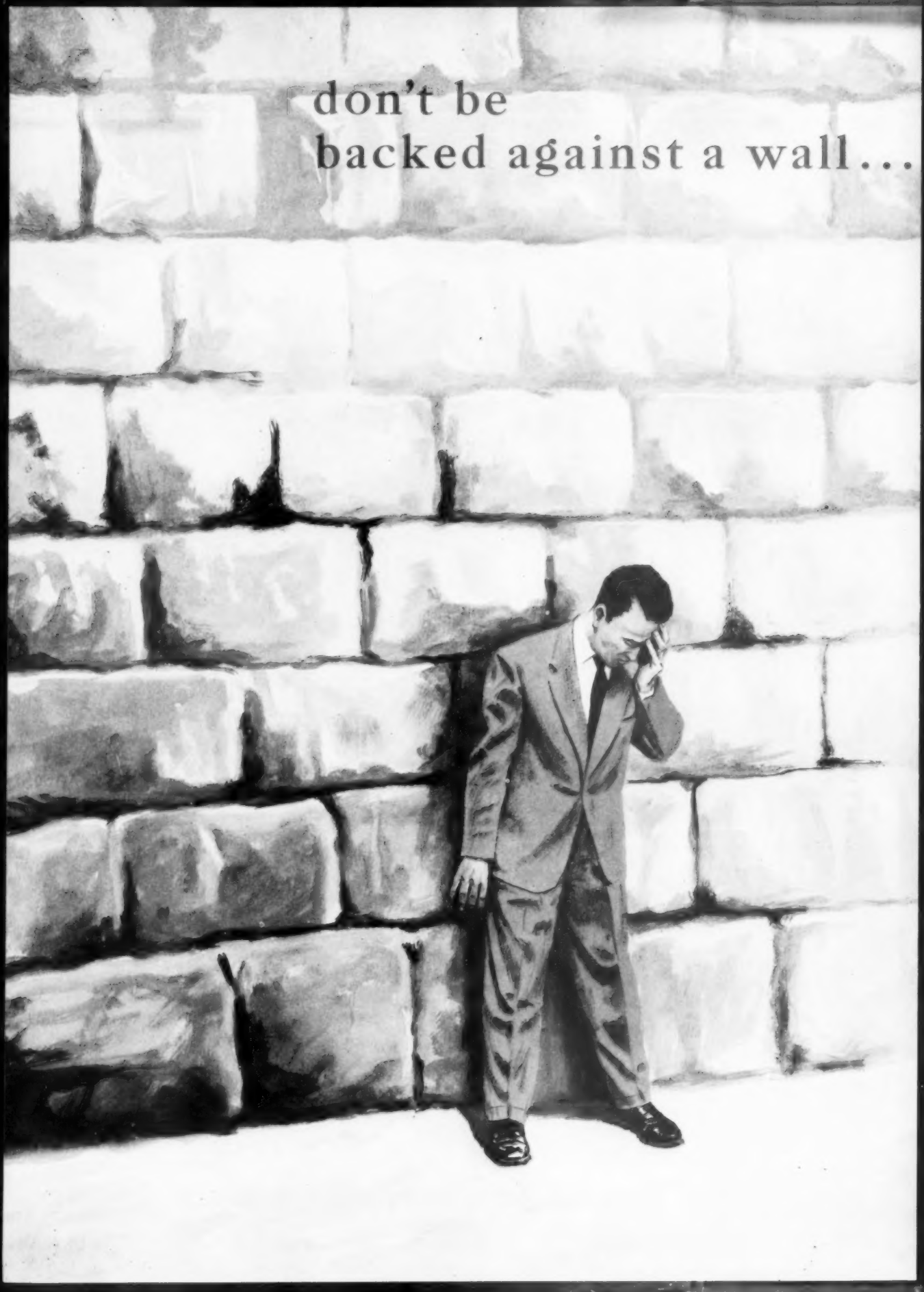
New Midwest Pricing Standards Rise 28

When Are Oil Shipments Interstate? 30

Soviet Oil Exports Hit Plateau 33

Ocean Tanker Rates Strengthen 39

Price 35 Cents


don't be
backed against a wall...

HIGH OCTANE MOTOR FUELS CAN NO LONGER BE LOOKED UPON AS A PRODUCT OF THE FUTURE. Today's automotive engines require them . . . tomorrow's needs will be even more demanding.

To keep pace with these continually changing requirements, petroleum refiners must appraise their present refining facilities to be certain that they will be able to produce the motor fuels that will meet the demands of their markets . . . meet them in the most efficient and economical manner possible.

With Rexforming*, Universal has cracked the octane barrier. In so doing, it has provided the petroleum refining industry with a process that will meet both the immediate and future octane requirements.

To be certain that the economics of inadequate facilities won't have you backed against a wall, you should examine

Rexforming

TRADE MARK

carefully. Study its economy . . . its flexibility . . . in relation to your own refining and marketing problems. Such an analysis should reveal the many benefits that can be yours through this new concept in petroleum refining.

UNIVERSAL
OIL PRODUCTS
COMPANY

UOP

30 ALGONQUIN ROAD,
DES PLAINES, ILL., U. S. A.
Laboratories: RIVERSIDE, ILLINOIS

Universal Service
Protects Your ***Investment***

**Developed by the Pioneers of Platinum Catalyst Reforming*

1105...YES, ELEVEN-O-FIVE

is the new-strength wire in Roebling's

Royal Blue

WIRE 1105 ROPE

AS SIZES and constructions go, Royal Blue is like the ropes you have used until now... but the likeness ends there.

Royal Blue is made of Roebling's new 1105 wire, the strongest, toughest wire developed up to now for use in any wire rope.

Royal Blue Wire Rope is as enduring as the wire from which it is made.

Write us for full facts on Royal Blue Wire Rope, or contact your Roebling distributor.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

PETROLEUM WEEK

Publisher — Harry L. Waddell

Editor — Herbert A. Yocom

•

Senior Editors — Glenn Green, Jr. (Houston), W. M. Jablonski, J. P. Mosher, Jr., Robert E. Spann, John Barton

News Editor — James M. Sutherland

Assistant Managing Editor — Richard M. Machol

Assistant Editors — William P. Sterne, Glenn Dietrich, Halsey Peckworth, Georgia Macris, Ade Ponikvar, Leo M. Murray, Arthur J. Matula, Jr.; *Chicago* — Leonard Castle, Frank Holman; *Detroit* — Holger Ridder; *Houston* — Marvin Reid; *Los Angeles* — Richard Elwell

Presentation Director — William A. Caparell, Jr.

•

Washington News Bureau — George Bryant, Manager; Glen Bayless: *Oil Specialists* — A. R. Patla, Clyde LaMotte, Roy Calvin, Ernest Conine, Dean Reed; *Staff Writers*—Alan E. Adams, Carter Field, Jay Flocken, Boyd France, William Gilmour, Sam Justice, Donald O. Loomis, Gladys Montgomery, Arthur L. Moore, E. William Olcott, Morton A. Reichek, Caroline Robertson, Vincent Smith

Domestic News Bureaus

Atlanta — W. H. Kearns, Frances Ridgway; *Cleveland* — Robert Cochran, William N. Troy; *Los Angeles* — John Shinn; *San Francisco* — Margaret Ralston; *Correspondents* — Albuquerque, Austin, Bakersfield, Bismarck, Boise, Cheyenne, Cincinnati, Corpus Christi, Dallas, Denver, Fargo, Great Falls, Honolulu, Jackson, Lake Charles, Memphis, Midland, Minneapolis, New Orleans, Oklahoma City, Philadelphia, Phoenix, Pittsburgh, Portland (Ore.), Sacramento, Salt Lake City, San Diego, Seattle, Shreveport, Spokane, Tulsa

Foreign News Bureaus

Editor — John Wilhelm; *London* — Edward W. S. Hull; *Paris* — John O. Coppock; *Bonn* — Gerald Schroder; *Rio de Janeiro* — Peter Weaver; *Mexico City* — John H. Kearney; *Tokyo* — Dan Kurzman; *Bombay* — Gordon Graham; *Correspondents* — Amsterdam, Beirut, Buenos Aires, Cairo, Caracas, Edmonton, Havana, Istanbul, Johannesburg, Karachi, Lima, Manila, Melbourne, Ottawa, Regina, Rome, Vancouver, Vienna, Winnipeg

Economics Staff—Dexter M. Keezer, Director; Robert P. Ulin, Peter J. Davies

•

Business Department

Advertising Sales Manager—Ervin E. DeGraff; *Business Manager*—Richard H. Loyer; *Sales Promotion Manager*—Peter S. Carberry; *Advertising Service Manager*—John E. Thompson; *Assistant to the Publisher*—George Reid (Houston)

•

Other McGraw-Hill Petroleum Publications

NATIONAL PETROLEUM NEWS
PETROLEUM PROCESSING
PLATT'S OILGRAM NEWS SERVICE
PLATT'S OILGRAM PRICE SERVICE

Vol. 1, No. 6—PETROLEUM WEEK—August 12, 1955

Published weekly by McGraw-Hill Publishing Co., Inc., James H. McGraw, (1860-1948), Founder.

Executive Editorial, and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Publication Office, 871 N. Franklin St., Chicago 10, Ill. Donald C. McGraw, President; Paul Montgomery, Executive Vice President; Joseph A. Gerardi, Vice President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice President, Publications Division; Ralph B. Smith, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising; J. E. Blackburn, Jr., Vice President and Circulation Director.

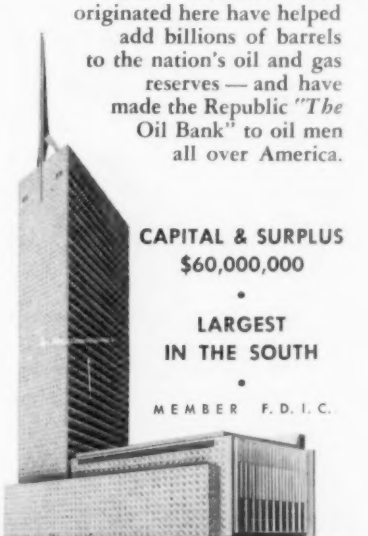
Subscriptions: Address correspondence to Petroleum Week, Subscription Service, 330 W. 42nd St., New York 36, N. Y. Current single copies, 35¢. Subscription rates, all countries: $3 for one year, $4 for two years, $5 for three years. Orders must indicate company, industry division, and position.

Second class mail privileges authorized at Chicago, Ill. Printed in U. S. A.

Copyright 1955 by McGraw-Hill Publishing Co., Inc. All rights reserved.

WHERE OIL WELLS BEGIN...

This is a picture of a part of the Oil Department at Republic. Behind long lines of doors to the right and left is a complete staff of experienced oil men, engineers and geologists. Behind *them* is the financial strength and the oil "know-how" of one of the first banks to make Oil Production Loans. Production loans originated here have helped add billions of barrels to the nation's oil and gas reserves — and have made the Republic *"The* Oil Bank" to oil men all over America.



CAPITAL & SURPLUS
$60,000,000

•

LARGEST
IN THE SOUTH

•

MEMBER F. D. I. C.

The Financial Center of the Southwest

REPUBLIC
NATIONAL BANK of Dallas

STRATAFRAC

DOWELL treatment fractures and acidizes in one operation for extra production boost

In a Stratafrac® treatment, advance-design Dowell equipment is used to pump acid-kerosene material into the pay zone to fracture and acidize in a single operation. Hydraulic pressure, suspended sand and acid all combine in an extra-powerful Dowell treatment designed to enlarge the well's drainage area . . . to increase permeability . . . to boost oil or gas production for you.

Yet down-time is short with Stratafrac. Liquid materials arrive at the well already mixed. Treatment is fast with minimum shut-in afterwards, and no gel breaker needed.

Stratafrac's unusual flexibility makes it effective in almost all types of formations. To match well conditions, Dowell engineers can vary acid and sand content, or add silicate control and clay dissolving agents. This double-action Dowell treatment has brought outstanding, *sustained* production increases to wells in almost every area.

For service, or for more information, call any of the 165 Dowell offices in the United States and Canada; in Venezuela, contact United Oilwell Service. Or write Dowell Incorporated, Tulsa 1, Oklahoma, Department H-75.

services for the oil industry

DOWELL

A SERVICE SUBSIDIARY OF THE DOW CHEMICAL COMPANY

60-Second Summary / WHAT'S HAPPENING IN OIL

AT-A-GLANCE PETROLEUM WEEK Copyright

August 12, 1955

dept/INDEX

Production	21
Refining	24
Marketing	28
Transportation	30
Washington	6
Key Prices	38
The Market Trend	39
Statistics	40
Editorial	44
International	33
Oil Men at Work	41
Special Report: Offshore Oil—III	15

New curbs on credit by banks won't hurt the petroleum industry's $5.5-billion capital spending program in the U. S. Bulk of oil industry expansion comes from earnings, and, since they're expected to keep on going up, plenty of money will be available for new facilities. . . . p. 9

•

Catalytic reforming looks more than ever like the most versatile tool yet designed for the oil refiner. U. S. and Canadian refiners are betting more than $390-million that this is the case. . . . p. 24

•

Diesel-electric rig power is catching on fast. These new "package units" are now being manufactured by two companies who claim their equipment is especially suited for deep-hole drilling. Such units cost more than power or steam units, but their efficiency should make them pay out. . . . p. 21

•

Atomic radiation as a possible new tool for petroleum refining and petrochemical processing is being studied by the oil industry. A broad program of research along these lines is gaining momentum. . . . p. 11

•

Office of Defense Mobilization this week asked 20 oil companies to tell how much foreign oil they've imported this year and what they plan to do next year. But ODM isn't expected to take action immediately on the imports dilemma. . . . p. 11

•

Oil exports from the USSR and satellite countries have reached a plateau this year, industry experts believe, in spite of considerable publicity on the Soviet bloc's oil-export drive. . . . p. 33

•

Group 3 (Oklahoma) pricing as a standard in the Midwest is declining, and a new Bureau of Mines report emphasizes it. Oklahoma refineries now have only 4.4% of the nation's capacity, compared with 18% back in 1919, when Group 3 was at its height. Rising rail rates are major cause of the decline of Group 3. . . . p. 30

•

A ruling is due soon on whether petroleum product reshipments made within a state are subject to federal control if the products originally came from outside the state. ICC Examiner R. E. Brady will hand down his findings sometime after Aug. 15. . . . p. 30

•

Talk of a merger of CIO's Oil Workers Union and AFL's International Chemical Workers Union is now out in the open. At midweek, the former publicly invited a start of discussions, called attention to the "vast organizing job (that) lies ahead for us in this jurisdiction."

Looking Ahead in Washington

McGraw-Hill
Washington
Bureau

August 12, 1955

There'll be more investigation of the National Petroleum Council. The House antimonopoly subcommittee, which touched on it during questioning of Assistant Attorney General Stanley Barnes last week, is just getting warmed up. It will go into detail in an October hearing, spurred on by Barnes' remark that the history of NPC has been "unsatisfactory" in some ways.

The Justice Dept. has long been skeptical of advisory groups, fearing their meetings provide an opportunity for behind-the-scene deals involving prices and markets—in violation of antitrust laws. It may concentrate on NPC because NPC is set up a bit differently from other industry advisory teams.

The Interior Dept. will defend NPC. Secretary McKay often cites it—as did his two immediate Democratic predecessors—as an example of what can be accomplished through government-industry cooperation.

•

Gasoline distribution practices will get a going over, too. The Senate antitrust subcommittee opens hearings Aug. 23, plans to take a close look at the oil industry. Another Senate group, the small business subcommittee, is readying plans for more probing of New Jersey gasoline price wars.

•

A proposed gasoline-price-war probe in Boston may be shushed. The Justice Dept. apparently doesn't want the grand jury investigation to take place. Insiders say it would show majors battling each other, and that proof of this would upset the agency's long-range plan for a nationwide price-leadership suit against top oil companies. Here's why: Under price leadership, one company supposedly sets the price pace in one area; another does it in another. But if two or more majors are fighting, there could be no price leader, and Justice's dream of a big suit would go out the window.

•

Co-ops will have to collect a 20% withholding tax on distributions, if a proposal made by Treasury Secretary Humphrey is adopted. Purpose would be to make certain that noncash allocations would be taxed.

•

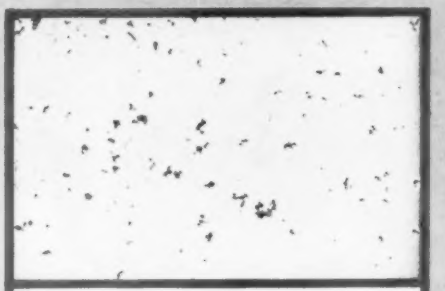
Plans for the final push on natural gas legislation are being mapped. The General Gas Committee, an organization set up last year by producers to help free themselves from federal control, will meet here in October to ready the drive to get Senate approval when Congress reconvenes. Big emphasis will be on convincing consumer groups that federal control will lead to higher, not lower, gas prices.

•

Here's a tip on the next Federal Trade Commission chairman. The man to replace Edward Howrey, who's resigning, likely will be Lowell B. Mason or John Gwynne—both now on the commission. Mason would be highly acceptable to the oil industry, but he was passed over when Howrey was named and may continue as a bridesmaid. This gives Gwynne, who isn't as showy with his conservatism, the inside track.

STABILIZE
DISTILLATE FUEL OILS

with *Nalco* Fuel Oil Treatments



Above—Untreated fuel oil, after aging, (magnified 200X) showing typical sludge formation.

Below—Nalco treated... same fuel oil... same aging, showing sludge prevention.

- STOP COLOR DEGRADATION
- PREVENT SLUDGE FORMATION
- INHIBIT RUST AND CORROSION

and

- FLUIDIZE OLD SLUDGE DEPOSITS

Action of Nalco Fuel Oil Treatment on your distillate fuel adds up to better marketability, easier handling, and lower storage tank and oil line maintenance costs. Nalco stabilization protects the original color of distillate oils, controls sludging tendencies . . . assures salability despite storage and handling delays that frequently deteriorate untreated oils. And once sold, Nalco treated oils perform better . . . cut down customer complaints of filter or screen clogging and burner fouling.

Nalco treatments give you all these benefits at low chemical dosage . . . and at low chemical cost.

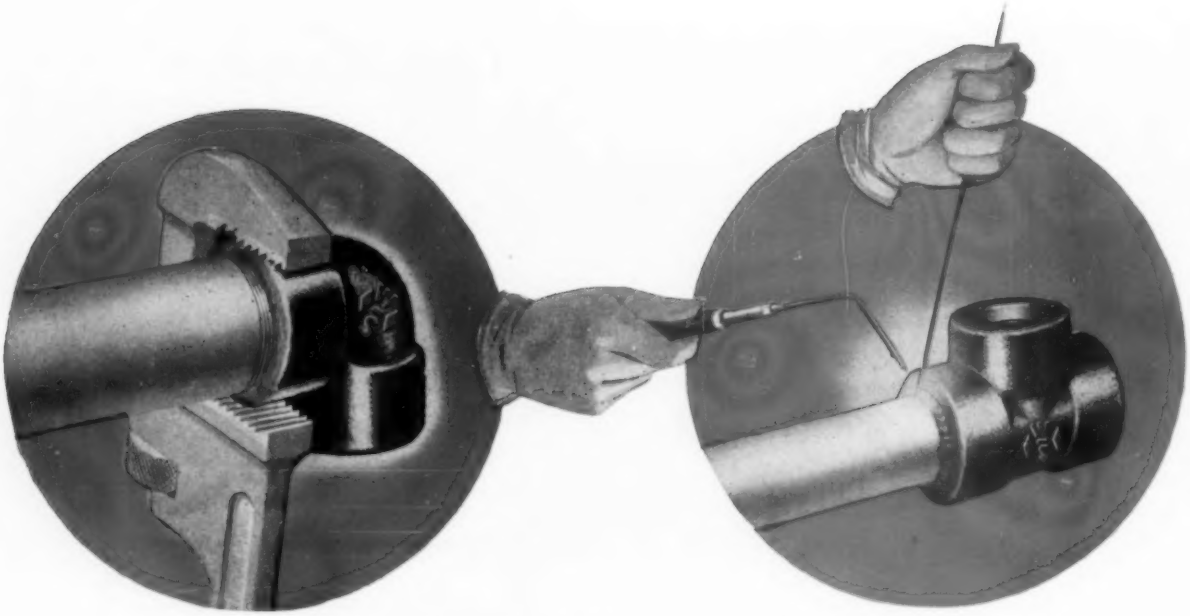
CLEAN TANK BOTTOMS

Sludge deposits in tanks of residual fuel and crude oil can be cleaned up quickly and conveniently with powerful dispersion type treatments offered by Nalco. Labor costs are eliminated, maximum storage capacity is restored, and *sludge is converted to usable oil.*

Write or phone today, for full data on Nalco stabilizers and dispersants . . . the effective, low-cost way to protect your equipment, *and to safeguard product quality.*

NATIONAL ALUMINATE CORPORATION
6300 West 66th Place • Chicago 38, Illinois
Telephone: POrtsmouth 7-7240
In Canada: Alchem Limited, Burlington, Ontario

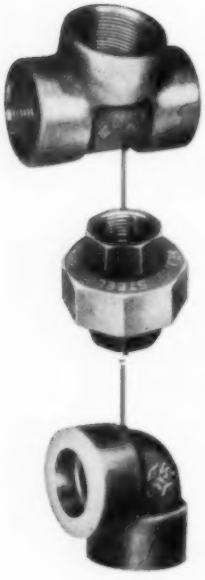
A *Nalco*® **PRODUCT... Serving the Petroleum Industry through Practical Applied Science**



INSTALL WATSON-STILLMAN FORGED STEEL FITTINGS...

...and get THESE IMPORTANT ADVANTAGES:

- Resistance to Pressure, Heat and Corrosion
- Long Service Life
- Low Maintenance Costs



Watson-Stillman Forged Steel Pipe Fittings are fabricated and designed for tough service...and long service. They're drop forged of high quality metal to produce a strong, tough, fiber structure that resists the stresses of high pressures, shock and vibration. And our forged stainless and alloy steel fittings give you the added advantages of resistance to high temperatures and corrosion. Watson-Stillman Fittings assure you of safe, reliable service in process lines, high pressure steam lines and other arteries of the operating equipment in your plant.

You can obtain a complete line of W-S fittings to suit your service and fabrication requirements. Available in Screw-End and Socket-Welding Types in Carbon Steel, 1¼% Chrome-½% Moly steel, 2¼% Chrome-1% Moly steel, Types 304, 316 and 347 stainless steel and Monel.

Send today for our informative bulletins.

Sold through leading distributors

WATSON-STILLMAN FITTINGS DIVISION

H. K. PORTER COMPANY, INC.

Roselle, N. J.

Where Oil Gets the Billions for Growth

EARNINGS

Historically, the most important source of capital for the oil industry by far. There's no sign of change, with cash earnings this year running ahead of 1954.

BORROWING

Loans from the public, banks, insurance companies. Minor source for most companies although important to smaller independent producers. A few big companies are taking sizable loans. Despite tightening credit, total oil borrowings should be up slightly this year.

SALE OF STOCK

Provides only small fraction of oil capital. Tighter loan credit may increase use.

SALE OF ASSETS

Insignificant source of capital industrywide, but maybe important for an individual company any one year.

Banks tighten up, but . . .

Oil Won't Lack Cash

The oil industry will have sufficient funds for its $5.5-billion capital spending program in the U. S. this year. Despite new curbs on credit by banks last week, "sound" oil projects will get the loans they need. And the bulk of oil expansion will be financed from earnings anyway.

The $5.5-billion figure is the estimate of Chase Manhattan Bank's Petroleum Dept., based on studies of 35 key oil companies. It's the amount the industry plans to spend to keep ahead of mounting oil demand in a growing national prosperity. Next year, oil expenditures should be at least as large.

Where will all the money come from?

Best answer is found in Chase Manhattan's 35-company analysis, which covers the 1954 operations of 21 majors and 14 smaller companies.

This analysis shows that earnings supplied 87.5% of working capital, borrowings supplied 6.5%, sale of stock 0.2%, and sale of assets and other transactions 5.8%. (Earnings include net income; capital extinguishment charges such as depletion, amortization, and retirement; and other noncash charges.) These figures indicate the industry pattern.

The large share of capital provided by earnings makes one development very significant:

Industry earnings for the first six months of 1955 promise a new high for the full year—assuring a good supply of internal capital.

Most of the big oil companies reporting for the first half of 1955 show profit gains over a very healthy 1954 (PW—Aug.5'55,p11). Net income gains for Texaco, Jersey, Gulf, Sun, Phillips, Socony, Cities Service, Indiana Standard, Lion Oil, Humble, and Richfield of Los Angeles all exceed 10%.

Latest reports show Sinclair's net up 4%, Sohio's 6%, and Ashland's 42% (for nine months). The health of producing companies is shown by Amerada's 70% increase in the second quarter and Houston Oil's gain of 20% in the first half.

Although outside financing is relatively far less important a source of capital than earnings, it plays a vital role. And with the earnings outlook bright, it's the situation in outside financing that warrants closest attention. The president of one of the larger majors observes, "A growth-minded oil company must maintain a financial position at all times that will let it obtain funds by each of the traditional outside methods—bank borrowing, sale of stock, and funded debt—regardless of the possible future adequacy of earnings."

And on the surface it looked like trouble for oil companies last week when Federal Reserve System banks raised the interest rate on loans to member commercial banks. Most of the 12 Federal Reserve district banks boosted rates from 1¾% to 2%. This was accompanied by increases in the prime rate (charged by commercial banks to leading borrowers).

Actually, the higher rates merely recognized a trend in effect for some time:

It's been getting harder for business to borrow from banks—although there is still money available for "good" oil projects by well-established companies. A New York banker says, "One of the majors could walk in today and wouldn't have any trouble." But he adds that generally the banks are taking a closer look at proposals of smaller companies and new borrowers. And some of these are being turned down. Sample comment from bankers in the Midwest and the East:

"Over all, I would say money will be available. But more marginal projects will find it hard to get support."

"Oil men will be standing in line with other good industrial risks for a lessening amount of loanable money."

"There is a reluctance on the part

of the banks to finance some oil projects that are not first-rate risks."

However, the industry's outside financing probably will be up over last year. Chase Manhattan Bank expects borrowing by the 35 companies it studies to hit $600-million this year—compared with $353-million last year. Reasons: (1) greater capital expenditures—up $150-million over last year; (2) rising costs of labor and materials; and (3) higher dividends being paid stockholders. All three factors are putting a greater strain on cash earnings than in 1954.

Important outside financing has already been done this year by Tide Water, Union of California, Pure, Shell, Phillips, and other big and medium-sized companies (such as Woodley Petroleum, of Houston).

Although the "pulse" of the industry signals closer credit, things are looser in the oil field country. A Houston banker says, "There is absolutely no tightness of money in this area for oil loans. It's just the other way around. There is terrific competition among Houston banks to make loans to established, well-heeled independents." Some banks are out scouting for operators who might want to borrow.

Big reason for this is that borrowing is what makes the wheels turn for many independent producers. After they have used loan capital to find new reserves, they return to the banks to get more cash for the next operation.

Oil men and bankers in the Southwest aren't worrying about higher interest rates. A spot check of Houston banks this week, for example, shows no rate increases in the wake of the Federal Reserve hikes. The thinking of the city's bankers is summed up by an official who says, "Any slight rise in interest rates won't make any difference to the producer. Oil loans have been going at 5% to 5½%. But the oil operator is playing for big stakes, and he'd pay 8% if he had to.

However, bank money isn't exactly flowing through the streets. One Texas banker reports that in his area, "We're playing our cards close to the vest, and betting on the sure thing. If one of our good customers comes in with a good deal, there are ways of finding the necessary money. But a risky venture, by a good customer or not, would get turned down pretty quick."

Most Texas banks still are insisting on security in the form of a mortgage on an independent's proven reserves before loaning to him. But bank competition is keen enough to produce exceptions.

Insurance company money is involved in many loans to producers. The banks, upon approving a loan, often will pass part of it on to an insurance company or a group of insurance companies with idle money.

Some Southwest bankers say independent producers will be practically forced to increase their outside financing. This is because of two factors hurting their cash position. First, the lowering of crude allowables since last spring in Texas, Oklahoma, and Kansas is resulting in less income from oil sales. Second, drilling costs are rising. And there's no crude price hike in sight, because of ample supplies.

When it comes to tidelands operations, the banks are wary.

"Because it's expensive," a Houston banker comments, "it's mostly the majors working offshore. Before making a tidelands loan, we'd want assurance the property is adequately insured against fire and storm. And frankly, we're more interested in proven production. The tidelands have good potential. But that's all. It's not time for banks to get into tidelands activity."

The pressure on producers for outside capital, plus tightening bank credit, may lead to more stock offerings, and to a spread in the already common practice among many companies of getting investment money from private sources.

Many Texas producers go to New York for financial aid from individuals. A Southwest banker notes "a popular trend right now for smaller companies to raise money by the sale of stock." He adds that investors "are as careful about their investments as a bank would be in making a loan."

And a Mid-Continent banker says, "Sound, small producing companies are getting money from eastern investment bankers—either through the sale of stock or through sale of an interest in the company."

Nonrecurring profit from the sale of assets is making sizeable funds available to some companies this year. Among these is Texaco, which got $8-million from the sale of 160,000 shares in Halliburton Oil Well Cementing Co.

And Standard of Ohio recently realized $1.6-million from the liquidation of two affiliates.

Tide Water's Giant Jigsaw Puzzle

Huge steel sections of what will be a 250-ft. converter column for an Orthoflow catalytic cracker lie on the ground at the site of Tide Water Associated Oil Co.'s new 130,000 b/d refinery, now under construction south of Wilmington, Del. A 220-ft. derrick will be mounted on the temporary structural steel platform at the left to hoist the sections into place. The crane at the right is aligning sections so that welders can assemble them before they're hoisted. The markings scrawled on the steel shell in the foreground are assembly instructions to the workmen.

ODM on Spot over Imports

Pressure is steadily mounting to force the Office of Defense Mobilization to say specifically what it will do —or will not do—about oil imports.

ODM officials realize that unless the whole oil-imports situation smooths out before next January, there will be a really serious move in the next session of Congress to get oil-import restrictions written into law.

This was made clear in a letter sent to Defense Mobilizer Arthur S. Flemming recently by 27 senators (14 Republicans, 13 Democrats) in which they asked him what he proposed to do about oil imports.

So, last week, ODM asked 20 oil companies to supply by Aug. 19 figures on their 1954 and 1955 oil-import ratios, together with their plans for the coming year. The action came after a meeting of the President's Fuels Policy Committee.

By getting definite figures from the oil companies on what each imported during the first half of 1954 and 1955, and by asking for definite commitments on what each company plans to do in the coming year, ODM feels it will be in a better position to bring a company into line, if necessary.

But ODM won't act on imports immediately. After it completes the gathering of more data from the importing companies themselves, ODM probably will hold some sort of public hearings before it makes any recommendations to the President. This is going to take time.

For the most part, ODM and the Administration in general would like to leave things as they are, depending on the oil industry itself to keep oil imports from overwhelming the domestic industry. However, ODM is keenly aware that it will not be able to continue this policy indefinitely.

There has been some confusion over just how much of an increase there has been in oil imports. One set of figures shows an increase of 14% in the first half of 1955 over the corresponding period last year. Another approach winds up with a 1% increase in the ratio of crude oil imports. Here is the reason for the difference:

The 14% figure is arrived at by comparing the import totals of 1955 with the import totals of 1954. The 1% figure is obtained by showing the proportion of imports to domestic production in each year. For example, the ratio of crude imports to domestic crude production rose from 9.8% in the first half of 1954 to 10.8% in the first half of this year.

Those who use the 14% figure contend this is a significant increase over last year and is solid grounds for immediate restrictive action by the President, as authorized by Congress this year. But those who use the 1% figure contend this is not "significant." They point out further that the President's Fuels Policy Committee request for a continuation of the 1954 imports pattern did not come out in time to allow companies to adjust their first-half import plans.

ODM is in a hot spot. A strong bloc of congressmen is pushing for import restrictions, but Administration leaders are leaning the other way.

President Eisenhower wants to encourage world trade, and there is little doubt he would be reluctant to exercise the power Congress gave him to restrict imports if national security was apt to be endangered. The President has never officially adopted the oil-imports policy recommended by the Fuels Policy Committee.

The Defense Dept. wants a strong domestic oil industry as its chief source of supply in case of war. But it wants to have oil available elsewhere too, and has shied away from approving import cuts. Even the Interior Dept. indicates it does not feel oil imports have yet reached the point of injuring the domestic industry substantially.

But the oil industry is divided over the issue. Domestic producers feel they have a clear-cut case of injury. Integrated oil companies, however, want to continue bringing in foreign oil for their refineries.

Refiners Push Atom Research

A broad program of research with atomic radiation as a possible new tool for petroleum refining and petrochemical processing is picking up momentum.

Oil company entries into this field became a threesome last week with announcements of individual research projects by Atlantic Refining Co. and Socony Mobil Oil Co. Esso Research & Engineering Co. heretofore had been the only oil company to announce publicly its work with nuclear energy as a potential process method. Other petroleum companies are understood to be conducting research in this direction but have not announced their activities.

The oil companies want to learn how atomic radiations influence chemical reactions and how this knowledge can be applied at a commercial plant scale. The researchers plan to study the possibilities of using radioactive materials to speed up chemical reactions already used in petroleum processing and to initiate possible new reactions.

This could lead to development of methods for producing higher quality products than are now feasible with existing process techniques. Particularly, one research program is headed in the direction of making higher octane gasolines.

The research presently started and planned with atomic radiation is a two-pronged attack.

Atlantic Refining has been working for the past three months on one approach. This is the use of an electron gun to fire a stream of tightly focused atomic particles into petroleum hydrocarbons. These electrons are aimed to break the bond between two carbon atoms in the hydrocarbon molecule.

The mechanism used by Atlantic is a one-million-electron-volt resonance transformer manufactured by General Electric Co. The atomic particles moving down inside a vertical tube are accelerated by magnetic coils up to speeds of 600-million mi. per hour. A thin metal "window" at the lower end of the tube permits the high-velocity particles to emerge into the air and bombard liquid or gaseous hydrocarbons.

Another approach is being investigated by Esso Research, which has had its program under way about one month. The company uses highly radioactive cobalt, which gives a bombardment of broader scope and greater intensity than the selected "rifling," or narrow bombardment, of the electron gun.

Socony Mobil will use both of these methods in its research. The company announced last week it would participate with seven other companies (not petroleum firms) to build a nuclear reactor. It also announced plans for a nuclear research center to be operated by the company.

The center will use a Van de Graaff accelerator—a "gun" somewhat similar to that used by Atlantic—to provide electrons, protons, X-rays, and neutrons for the "rifle" technique of blasting carbon atoms apart. Socony will also have "hot" labs for manipulation of fission-waste radio-isotopes and of secondary radioactive elements such as Antimony-124, Cobalt-60, and Iron-59.

What's New / IN THE INDUSTRY

Higher Oil Demand Seen

The Bureau of Mines last week gave official confirmation to what oil companies had already believed to be true: Petroleum demand this year will be much higher than previously anticipated.

A revised forecast by the bureau places total 1955 demand for all oils at an average of 8,592,000 b/d, a gain of 6% over 1954. The percentage gain now anticipated by the bureau is twice the original forecast for 1955, made last December.

The bureau's revised forecast places the gain in domestic demand for all of 1955 at 6.5% and predicts a decline of 5.4% in export demand for U. S. oils, compared with 1954. The gain in total demand (domestic plus export) for the full year, compared with 1954, is broken down as follows: gasoline, +5.4%; residual, +5.1%; distillate, +6.2%; kerosine, −4.2%, and all other oils, +10.8%.

Demand for domestic crude oil, the bureau estimates, will average 6,715,000 b/d, up 5.1% over 1954.

•

Shell-OCAW Pact Hailed

Shell Oil Co. and Shell Chemical Corp.'s joint new contract with the Oil, Chemical & Atomic Workers Union, CIO, covering their Deer Park (Tex.) plants, is being hailed as an agreement of worldwide significance.

Upon ratification of the nondiscriminatory job bidding agreement last week by the union, some Houston area Negroes agreed to withdraw a lawsuit against OCAW and to withdraw a complaint registered with the Defense Dept. against the companies.

The new agreement, covering Shell's refinery and Shell Chemical's petrochemical plants at Deer Park, was 18 months in the making.

In the past, the two plants had two categories of common labor in which new employees were placed. OCAW said only Negroes were placed in the labor category, and only whites in the general helper classification. Employees in the labor department were limited in bidding for better jobs, whereas employees in the general helper class were not.

The new agreement abolishes the labor department and makes it a job classification. New employees, regardless of race, will be assigned to the labor classification when they are hired. All will have equal opportunity to bid upward.

•

Esso Standard Oil Co. is eyeing the Delaware River Valley as a possible site for future expansion. The company has taken options on about 1,800 acres near Penns Grove, N. J., about 30 mi. southeast of Philadelphia. Refinery or storage facilities may be built there, but an Esso spokesman emphasized that the options will be exercised only if the firm finds the area suitable for expansion purposes.

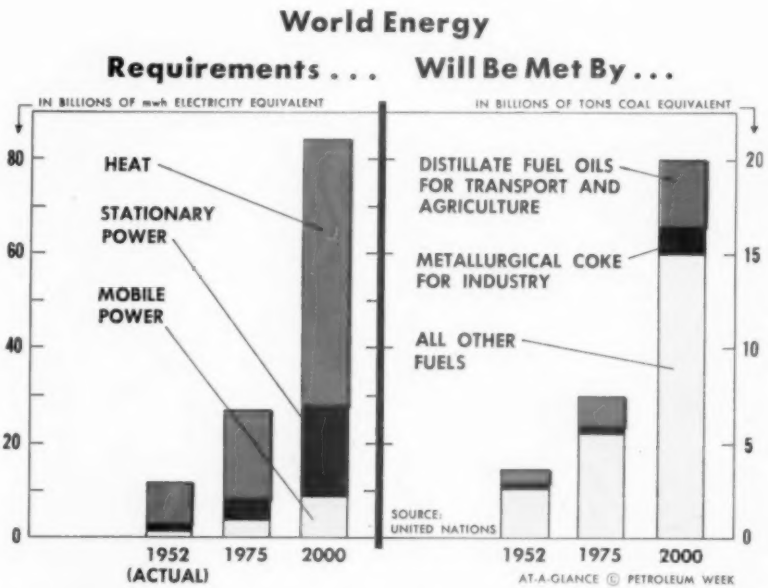
•

The Oil Industry Information Committee's grass roots campaign took a body blow from oil jobbers this week. The South Carolina Oil Jobbers Assn. voted to withdraw support of OIIC's program, after being told by John White, chairman of the National Oil Jobbers Council, that OIIC and major suppliers do not recognize jobber problems. White also stated he would ask NOJC itself to drop OIIC support unless solutions to jobber problems are worked out before the council's Nov. 2-4 meeting in Chicago.

•

The Texas Co. wants a federal district court to decide whether or not union members must pay for refinery damages resulting from a "sympathy" strike. The company has filed suit in Camden, N. J., against the Oil, Chemical & Atomic Workers International Union (CIO).

Union members at the firm's Eagle Point Works, in Westville, refused to report to work for June 20. They were supporting a strike of the National Maritime Union against the company's tankship operations. The resulting shutdown caused $74,226 worth of actual damages, the company claims. Crux of the suit is the question of whether union members violated a contract no-strike provision.



World Energy Needs to Zoom, U.N. Says

The world's energy requirements may increase eightfold in the next half century according to a United Nations report presented this week at the International Conference on Peaceful Uses of Atomic Energy in Geneva, Switzerland.

Total fuel demand will not increase correspondingly, however, because of increased efficiency in the use of oil products and other power sources. "Fuel supplies will probably need to increase at a rate of only 3½% per annum," the U. N. report says.

By the year 2000, nearly all the power used in transportation and agriculture is expected to be derived from internal combustion engines burning petroleum fuels. This may well increase demand for oil products in these two fields better than fivefold, as compared with 1952 levels.

BEAIRD-INGERSOLL-RAND
Packaged Compressor Plant

Lowest Cost Per Horsepower Installed

ROWAN AND HOPE installed a compressor station at its Sweetwater gasoline plant to convert to profit flare gas from nearby Nolan County Wells. Upon recommendation of the design engineer, the station was equipped with a 10SVG 550 h.p Beaird-Ingersoll-Rand packaged compressor plant. Picking up 2,500,000 cubic feet of gas daily from the wells at 5 psig, the unit operates with three stages of compression. As the gas leaves each stage, it is cycled through the plant for processing. Finally with both gasoline and LP-Gas removed, the residue is delivered to the sales line at 525 psig.

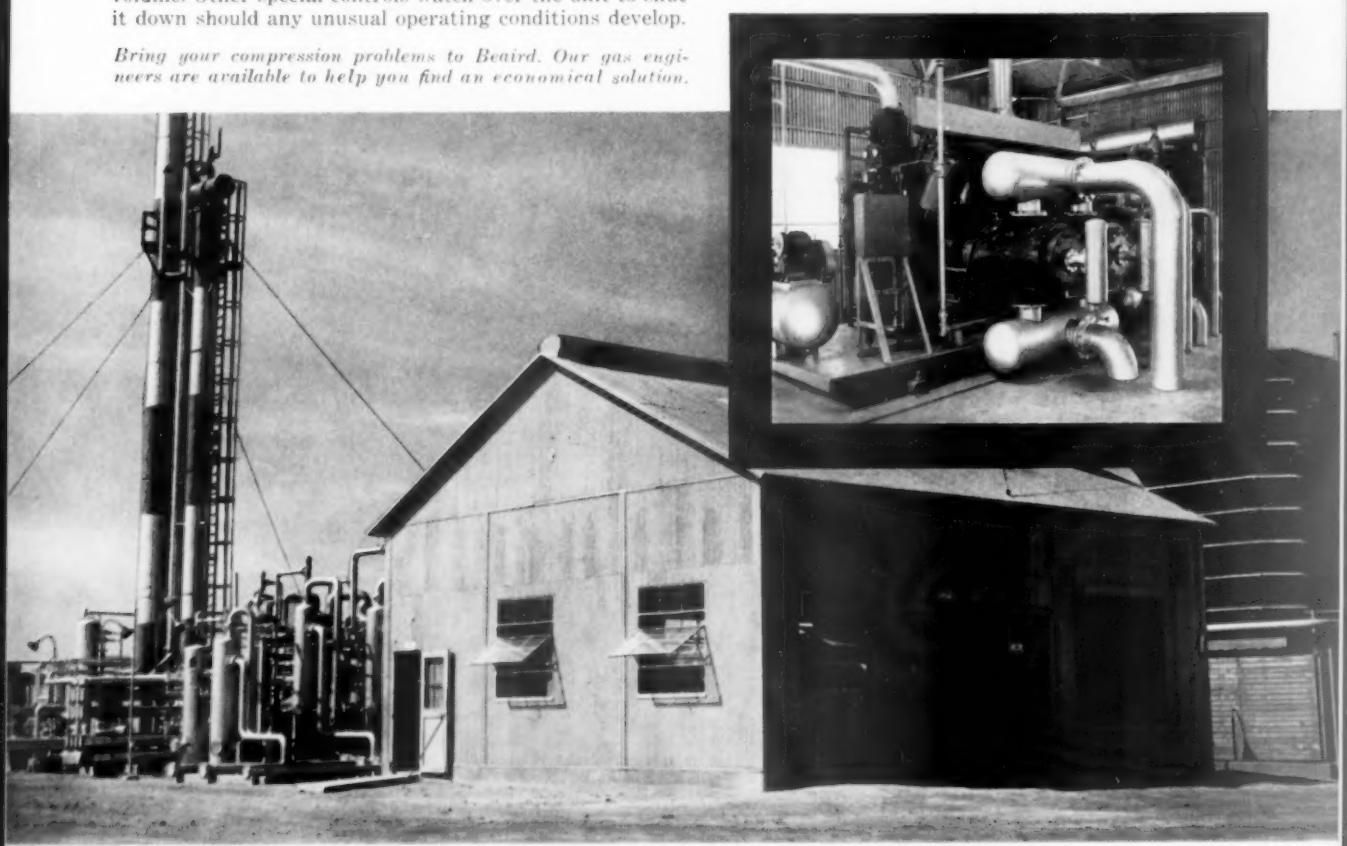
Rowan and Hope have found the unit to be exceptionally economical. Definite savings in both time and cost of installation were realized by the shipment of the compressor plant, fully assembled, directly to the Sweetwater location. And in 15 months of continuous service it has been down only a few hours. In each instance, the trouble has been of a minor nature.

Designed for unattended operation, the unit is equipped with automatic controls that permit it to speed up or slow down while maintaining constant processing pressure and volume. Other special controls watch over the unit to shut it down should any unusual operating conditions develop.

Bring your compression problems to Beaird. Our gas engineers are available to help you find an economical solution.

Packaged Compressor for—

"VEST POCKET" GASOLINE PLANT



Rowan and Hope compressor station, Sweetwater, Texas—equipped with a Beaird-Ingersoll-Rand 10SVG 550 h.p. Four Cycle gas engine driven compressor, Young radiator and all necessary equipment and controls. Other sizes 110 to 660 h.p.

THE J. B. BEAIRD COMPANY, INC.
Shreveport, Louisiana

BEAIRD

MACHINING • MANUFACTURING • STEEL WAREHOUSE

PACKAGED COMPRESSOR PLANTS

CAST STEEL FITTINGS

PRESSURE BULK STORAGE

ANHYDROUS AMMONIA EQUIPMENT

LP-GAS SYSTEMS

200,000,000 GALLON STOREHOUSE

Industry, too, stores up the fruits of a busy summer to meet winter needs. This seasonable balancing of supply and demand is especially critical with industries making volatile products that require pressure storage. Since 1918, these industries have depended on storage vessels built by Beaird's pressure storage division.

Now producing over 42,000 gallons in storage daily, the pressure storage division has supplied industry with more than 200,000,000 gallons of reserve capacity. This combination of experience, know-how and facilities merges with those of four other Beaird manufacturing divisions to bring the customers of all five the finest products for their industries.

Let us quote on your standard or special storage requirements. Write: The J. B. Beaird Company, Inc., Shreveport, Louisiana.

Beaird's pressure storage division serves refineries, LP-Gas marketers, anhydrous ammonia manufacturers, chemical processors — and many allied petro-chemical industries.

PACKAGED COMPRESSOR PLANTS

CAST STEEL FITTINGS

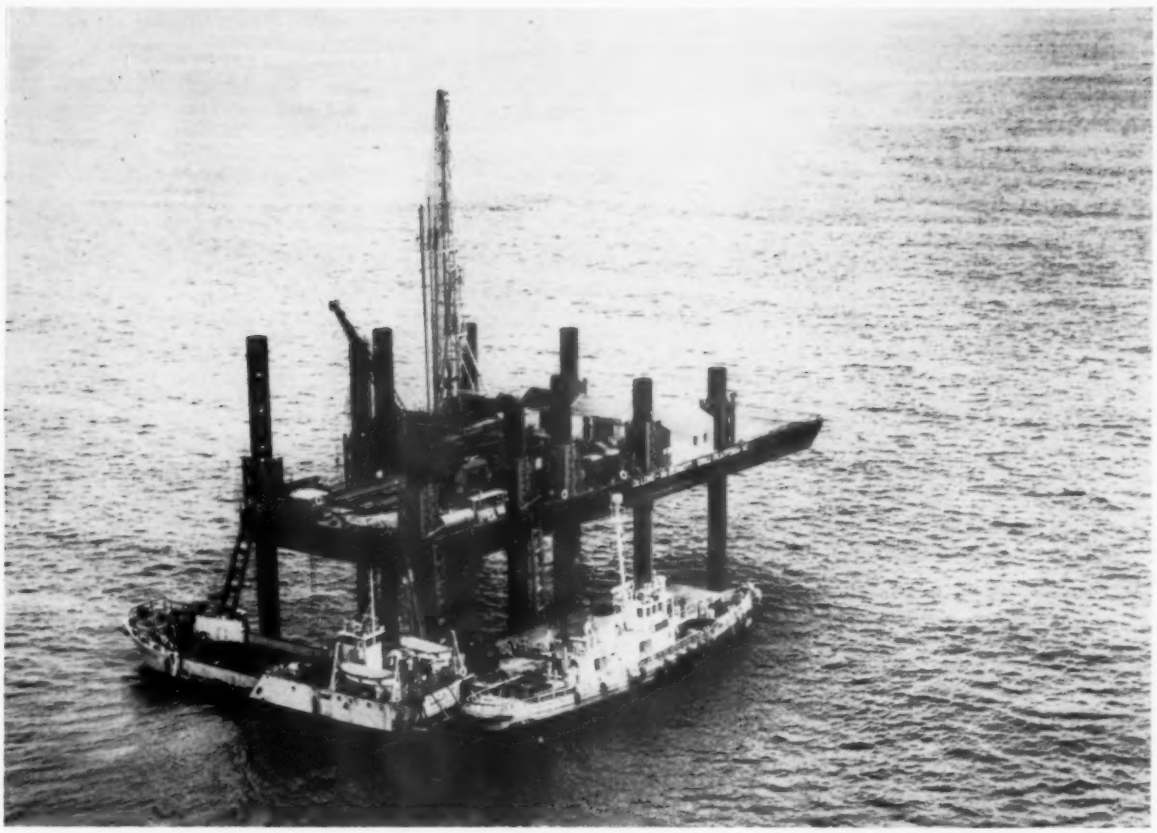
PRESSURE BULK STORAGE

ANHYDROUS AMMONIA EQUIPMENT

LP-GAS SYSTEMS

BEAIRD

MACHINING
FABRICATING
STEEL WAREHOUSE



On the Continental Shelf:

Oil Puts New Tools to Work

LAST OF THREE PARTS

Up to now the search for oil and gas under the Continental Shelf has been largely a makeshift proposition.

Most offshore oil operators have had to adapt whatever land equipment they could find for use in drilling and producing over water. Many times this equipment proved to be too bulky to handle on the narrow confines of an offshore platform or in a drilling tender. Other times it has proven entirely inadequate to do the proper job.

Nor has proper equipment been the offshore operator's only problem: His entire method of operation over water has been pretty much on a "feel-as-you-go" basis. Not familiar with marine work, the offshore operator many times has had his entire routine fouled up because of improper scheduling or lack of appropriate facilities.

But now the offshore operator has finished his "shakedown cruise." The period of improvisation is over.

Because of his needs for foolproof, dependable equipment, and methods of carrying on his offshore operations uninterruptedly, the offshore operator's whole concept of work on the Continental Shelf is changing. He has learned to cope with perplexing day-to-day problems, and is no longer tied to the land. In fact, he's getting to be a real old salt.

Today, offshore oil is a big business—a brand-new business in its own right. And it is entering an era of specialties. The offshore oil operator is now in an era of specialization—in tools, in equipment, in transportation, in producing and operating procedures.

Major changes appear to be immediately ahead in offshore operations. For one thing, drilling in real deep water, a long way from land, will soon be a reality. Today, operations are being carried on in water nearly 100 ft. deep by one group of operators, CATC. This group, made up of Continental Oil Co., operator; Atlantic Refining Co., Tide Water Associated Oil Co., and Cities Service Oil Co., has been drilling off Grand Isle, La., in 97 ft. of water, and its first wildcat found oil there last month (PW—Jul.22'55,p18). CATC plans soon to drill a well on a permanent platform standing in 125 ft. of water. And it is expected that operators in other areas will be moving out at least to 150 ft. soon.

Some operators predict it won't be

SUBMERSIBLE BARGE, "Mr. Charlie," was built at Alexander Shipyards, Inc., in New Orleans for Ocean Drilling & Exploration Co. Unique feature of this unit is that all drilling equipment except draw works is located in the lower hull, which is sunk to bottom of ocean. Submersible units such as this operate in waters only up to 45 ft. deep.

long before drilling will be carried out in water as deep as 600 ft., and up to 100 mi. from shore. It's impossible to drill in that depth of water now, mainly because no adequate drilling platforms for operations at that depth are yet available.

The small independent oil operator is getting ready to splash in offshore, too. He wants to find new oil and gas reserves under the sea as much as the majors do. Because of high costs, there is an increasing tendency for the small operators to get together and form combines to spread the risks of investment offshore.

Says Thomas L. Jordan, a former successful Mississippi River boat and barge operator, now president of American Tidelands, Inc.:

"Little people like us are going to be in offshore in a big way before too very long. Big for us, that is. I don't believe the immensity and fantastic expense of offshore operations is going to stop the average American investor from putting risk capital into the search for offshore oil." American Tidelands was one of the first companies ever formed to specialize in offshore drilling and production. It has built two submersible-type drilling barges (picture, page 20); it financed its first through sale of stock to the public.

"Right now," says Jordan, "exploration and lease costs are too much for us. We're finding a solution in the formation of drilling-contracting companies like American Tidelands. We'll get our experience from work we do for the majors. And the day will come when we'll go out for ourselves."

Already, one independent is "in" offshore, in a pretty good way, and he's preparing to expand operations extensively.

John W. Mecom, Houston oil man who has already been operating offshore as "U.S. Oil Co. of Louisiana & Texas," has just entered a limited partnership with San Jacinto Petroleum Corp., also of Houston, to form "Mecom Petroleums." The new firm will spend "a minimum of $25-million in the next three to five years in developing oil and gas properties" in the Gulf and South Louisiana.

There are indications that the extremely high costs of leasing and operation offshore are starting to drift down a bit—both for initial investment and operational expenses. Most offshore oil men think the July lease sales off Louisiana (PW—Jul.22'55, p14) marked the "high tide mark for the biggest lease play in the world." If this is true, it will open up the way for the independent operator to get more leases in the future.

There will, of course, be some tracts still going for fabulous prices, but, over-all, the future prices for offshore leases should taper off, say some operators.

Most important of the upcoming changes in the offshore game is the fact that tailor-made, specialized new equipment is beginning to appear which will enable the offshore operator to get where he wants to go—and do what he wants to do—on the Continental Shelf.

To date, offshore drilling operations have been carried on in three general ways: (1) from permanent, steel drilling platforms, self-contained and including crews' living quarters; (2) from permanent template platforms, which use attending drilling vessels to hold necessary equipment and to serve as quarters for the crew; and (3) from the new-type submersible units, which, built in the form of barges or "mobile platforms," are completely portable, and can go from location to location.

The self-contained drilling platform will be favored in the future. This type of unit, originally thought to cost too much, has proven most effective for deep-water operations. And deep water is where most operations will be carried out in the future.

The self-contained platform was the first means of making hole offshore. It dates back to Humble Oil & Refining Co.'s drilling 7 mi. off Grand Isle, La., in November, 1947. Humble's operation was the first in the really unprotected waters of the Gulf. The platform required 114 days to build and install, and cost in the neighborhood of $1.2-million.

Humble's platform is still in use, as a production platform. It is double-decked, with each deck covering nearly an acre of space (206 x 110 ft., 34 ft. and 45 ft. above mean water level). It provided living quarters for 54 men, and was designed to withstand winds up to 120 m.p.h., and 34-ft. waves. Its 10-million lb. are supported by 100 steel pilings driven through tubular corners of 25 templates, which provide lateral bracing. About 2,000 tons of steel went into the platform.

CATC's recent successful wildcat was drilled from the biggest self-contained platform ever built. It will handle nine wells, drilled directionally. Initial investment ran to more than $1.5-million. When the platform's quota of wells are drilled, it will be converted into a production station.

CATC plans to spud in a wildcat in 125 ft. of water sometime next year, and the odds are that a similar self-contained platform will be fabricated for the job.

The template-type platform, smaller in size than the self-contained platform, and calling for use of a tender ship, is cheaper to construct. It will remain popular in waters up to 75 ft. or 100 ft. deep. There are two drawbacks to such a setup however: (1) The tender ship costs from $1.5-mil-

lion to $2.5-million, depending upon its type, and on whether or not it is self-propelled; and (2) farther out from shore, where ground swells of the ocean are greater, the tender ship is subject to too much down-time because the sea often makes it impossible to transfer men and equipment from smaller personnel and equipment boats to the tender itself.

Also, it becomes impossible at times, because of the weather, to move equipment from the tender to the platform to which it is tied.

The self-contained platform costs about $3,500 a day to maintain. A template platform and tender ship costs about $5,000 a day, including depreciation on the tender.

One of the latest ideas on drilling platforms is to rent them—not buy them. The idea hasn't exactly taken hold yet, but some operators reportedly are investigating the feasibility of such a plan. If a wildcat pans out, the oil operator would then buy the platform and turn it into a production platform, with the rental applying on the purchase price. If the well proves dry, the rental would stop and the construction firm that installed the platform would retrieve as salvage all it could.

Design of self-contained and tender-type platforms varies, but basically all are the same. They consist of (1) steel piling, and (2) a lower "jacket" assembly, over which is placed (3) a top assembly containing the rig floor.

In the field of new design, J. Ray McDermott Co. is building a new single-section, double-deck platform with just half the area of a three-section platform. But it will carry almost as much equipment. The decrease in deck area is expected to eliminate from one-half to two thirds of the cost of customary supporting piling.

Total cost of such a platform will be between $700,000 and $800,000—instead of the present $1.2-million for one of equal capacity.

Pure Oil Co., looking ahead to the intensified wind-and-wave problems of the far offshore, recently hired an oceanographer to help it design the safest possible anchoring system for an offshore platform. The expert ran up against the fact that there is a diminishing return in designing supports to withstand expected or predicted forces from wave action. The higher the waves, the larger must be the supports, of course. But after these supports attain a certain diameter, any further increase begins adding as much resistance as safety, compelling the need for even larger supports.

The oceanographer and Pure's engineers kept working on the problem, however. As an answer, they came up with a giant "wheel" (see picture, page 19), which they added to the bottom of the supporting columns of the platform.

The wheel is a steel device, 7 ft. high and 12 ft. in diameter. On the bottom side is a latticed "funnel" in which there are four 30-in. holes. The platform's main 30-in. tower supports are welded to the center (peak) of the funnel. Funnel and wheel are driven through the soft silt of the ocean floor until they reach solid soil. A 26-in. piling is then driven through the 30-in. tower support, and on through the funnel for about 80 ft., down into the floor of the sea.

Four additional 30-in. pilings are driven through the four holes in each wheel, until their tops are below the top of the wheel, and they are far down into the earth. The wheel is then filled with concrete.

With this design, only eight 30-in. tower legs are exposed to the beating of the waves, yet each has a 26-in. column and four additional 30-in. supports pinning it firmly in position.

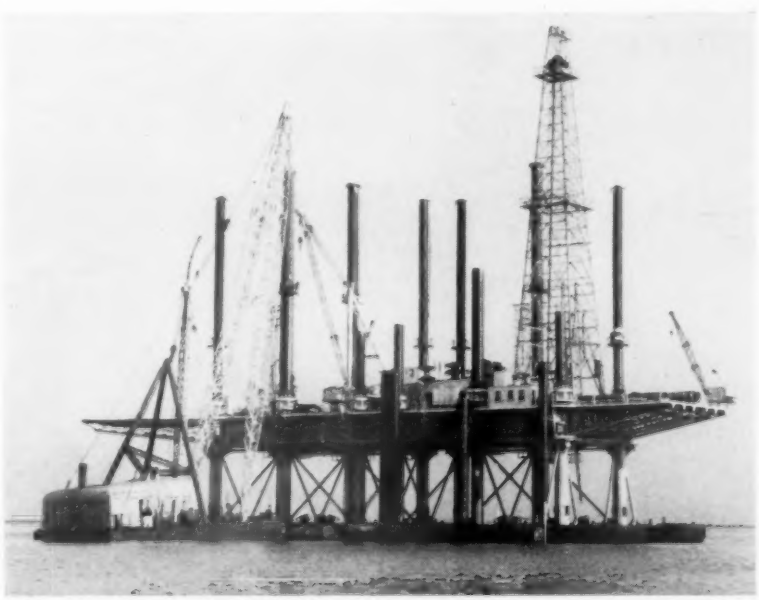
Shell Oil Co. has had piling problems, too. Says John Orrell, chief mechanical engineer: "In the mud and slush of the East Bay area off the Mississippi delta bottom you practically have to hang onto the piling for at least 200 ft. down (in the silt). If you let it go, it will slip away from you and bury itself in the bottomless ooze."

Shell determined that none of its existing platforms or mobile units available were adequate for the job at this location. So company engineers conferred with J. Ray McDermott Co. for a solution.

The result is a $1.2-million platform, with 43 main pilings each 465 ft. long, each penetrating the mud line down to 375 ft. The pilings were driven down to 200 ft. before any kind of solid "bottom" was reached. Since this platform is located in 72 ft. of water, two additional measures were necessary in order for the structure to withstand wave force: (1) Ten more pilings were sunk from the mud line down, along the length of the platform; and (2) three cross-welded steel frames were sunk 20 ft. into the mud to help withstand side action caused by wind and waves.

The entire platform contains about 2,500 tons of steel. Orrell points out that such a platform for a single well would cost about $800,000, which would be out of the question. But Shell plans to drill 12 directional holes from this one platform, which makes it economical to use.

Portable submersible barges and platforms hold great promise, but their high costs, both of building and of maintenance, will keep them



MOBILE PLATFORM, "Mr. Gus," built by Glasscock Drilling Co., Corpus Christi, is contracted to Shell Oil Co. The largest mobile offshore drilling unit yet built, this portable platform can operate in water up to 100 ft. deep. Bottom hull sinks to ocean floor, providing firm foundation for entire structure while drilling.

on the sidelines. Primary advantage of such units are their stability and their mobility. If a well drilled is dry, the unit can be quickly moved to another location, with no loss of equipment. Barges can operate, however, only in waters up to 45 ft. deep.

Their costs, so far, have been prohibitive for most operators—running up as high as $4-million. And operating cost runs from $8,000 to $10,000 a day—compared with only $3,500 a day for a self-contained platform.

There is no question but what a portable submersible barge could be built to operate in waters of 150 ft. depth or deeper. But most oil men agree that the added cost would be so great that the units would not be economically feasible.

They will still be used, though, in shallow waters for wildcats closer to shore, and for development drilling.

First of the portable submersible barges was designed and built at Alexander Shipyards, Inc., New Orleans, for Ocean Drilling & Exploration Co. The Odeco barge operates in an unusual manner. A giant over 200 ft. long, standing as high as a six-story building, the huge drilling barge has all of its major drilling equipment, with the exception of the rotary table and draw works, down in the lower steel hull. This hull is sunk during the drilling operation, so, in effect, the drilling-engine room is like a submarine. When a well is completed, air is pumped into compartments, and the entire unit refloated.

American Tidelands' two barges, built on similar lines, differ in one major respect: All of their drilling equipment is located on the upper deck; none of it is submerged during the drilling operation.

There have been only a few of the huge portable "platforms" built to date. Glasscock Drilling Co., of Corpus Christi, built its "Mr. Gus," a big unit which can operate in water up to 100 ft. deep, and Consolidated Western Steel Co. spent $3.5-million to build a large unit on the principle of the DeLong barge, made famous by the Navy.

In the "Mr. Gus" drilling operation, a huge bottom hull is sunk to the ocean floor, and steel pilings driven through it and anchored. After a well is drilled, the bottom hull is refloated, and its rise lifts the upper hull into a floating position.

On the DeLong principle, the bottom hull is sunk, like the "Mr. Gus" hull, but the upper deck, containing the drilling equipment, literally "jacks itself up" on huge steel pilings. The weight put on the pilings causes the bottom hull to place itself firmly on the ocean floor.

An early model of this type of unit has been operating in Gulf waters up to 50 ft. deep since 1954. Humble Oil & Refining Co. has been using it to drill core tests to evaluate possibilities of sulfur deposits off Grand Isle, La. Consolidated Western's new model is capable of drilling in water up to 100 ft. deep, and its rig can drill 15,000-ft. holes.

This "latest" model is by no means the last word in portable equipment. Consolidated Western says, "We now have plans on the drawing board for two more units, and these will have even more major improvements."

Other new advances are embodied in designs now on the drafting board at Friede & Goldman, Inc., New Orleans, for The California Co.'s new mobile rig.

This unit is being projected for operation in waters up to 120 ft. deep. It will have two hulls, the lower one nestling in the upper one, rather than separated, when the rig is afloat. On location, the lower hull (5 ft. deep) will be depressed to the ocean bottom. A lower lip, projecting beyond the mud line, will minimize scouring, or washing away of soil from around the hull. The upper hull will be raised to the desired level for drilling.

Raising and lowering of both hulls will be accomplished by hydraulic means, using sea water as the fluid. No clamps will be necessary, and the jacks will have a 40-ft. stroke. This will reduce time required to negotiate the dangerous interval between the time the lower hull contacts the bottom of the sea, and the upper hull is first raised out of the water.

The upper hull will be 220 ft. long by 33 ft. wide by 14 ft. deep. The drilling slot will be 32 ft. wide by 33 ft. long. The lower hull will be 130 ft. long and 5 ft. deep.

There will be provisions for storage of 15,000 ft. of drill pipe, 300 ft. of surface casing, 1,000 sacks of cement, 2,000 bbl. of dry mud, 200 bbl. of potable water, and 1,000 bbl. of fuel oil. There will be living quarters for 40 men.

In its floating position, this barge can double as a drilling tender, and will be the largest mobile barge yet introduced into the offshore-drilling picture.

Drilling rigs, too, have been especially designed for platform drilling offshore.

The California Co., of New Orleans, was the first to come out with an entirely new drilling rig, designed specifically for offshore drilling. Installed on a permanent platform, this rig, which Calco calls a "multiple well derrick," can drill six wells without being skidded. Because of a unique guide-sheave arrangement in the crown-block area, the crown blocks and rotary table alone are moved from location to location. This cuts down tremendously on the time ordinarily

LATEST IN DRILLING TENDERS have been built for the CATC Group. This one is shown tied up to a template-type permanent platform off the coast of Louisiana. CATC has built four such vessels, at a cost of $1¾-million each. They incorporate the latest in drilling equipment, are non-self-propelled, and so must be towed to location.

required in skidding an entire rig on a platform. The equipment proved so successful Calco ordered another, and plans to install a third on a submersible barge. Calco engineers worked with Lee C. Moore, Inc., engineers on the design of the multiple-well derrick.

Shell Oil Co., working with engineers of J. Ray McDermott Co., has designed a rig similar to the Calco-Moore setup. It will be capable of drilling 12 holes. The rig is made up of two identical "floors," each containing six pre-positioned slots for the rotary table. After the six directional holes are drilled on one platform, with the aid of moving crown blocks and rotary table, a derrick barge will lift up the entire rig, mast and all, and set it over the adjacent rig floor. Then six more holes will be drilled—all on the same platform.

Now coming into use are specially designed "packaged" diesel-electric drilling units. General Motors is making such an oil-rig power-generator setup; so is American Locomotive. Their use is expected to increase offshore (page 21).

Another type of new equipment that's coming is remote control for producing operations on platforms as far as 100 mi. at sea.

Gulf Refining Co. has been experimenting with radio-controlled production facilities offshore, and pneumatic controls onshore. The radio equipment has been designed to bring "automation" to the field. With it, an operator can automatically handle the complete production task, by remote control.

Gulf is pioneering in the field of VHF-radio remote-controlled facilities at Timbalier Bay field, off the Louisiana coast. In this installation, still in the experimental stage, all flowing wells and lease tanks are controlled from a distant field office.

Operational hazards offshore led to the study of this type of automatic operation. Cost of the necessary equipment is prohibitive right now to most oil operators. But with continued improvements, the economics of such an automatic producing setup should soon come within the realm of practicability.

Briefly, Gulf's system enables a man to control the producing cycle by pushing various buttons on a console located in the field office on shore. He can start any well flowing into tanks at will, or can shut any well in at any time. He can switch from one tank to another manually, or he can set the system to do so automatically.

A series of tone signals is emitted from the intricate radio equipment in the field office. By listening to these audible tones, and looking at the colored lights on his control console, the production man knows instantly just what's going on in the field, miles away.

Motorola, Inc., of Chicago, manufacturer of the radio equipment, says such a system will be effective up to 70 mi. from shore. It's likely that some such automatic system with an effective range up to 100 mi. from land may eventually be installed successfully.

Such an automatic operation would enable work to go on at a remote offshore platform without interruption. No lives would be endangered during rough weather, because routine field work by personnel would not be necessary during the storm. All wells could instantly be shut down automatically on shore if a storm threatened the platform at sea.

BIG "WHEEL," added to the bottom of supporting columns of Pure Oil Co.'s offshore drilling platforms, aids in stability. These wheels are 7 ft. high, 12-ft. in diameter.

Equipment isn't all that's new. New methods of supply have also evolved as a result of offshore operations.

The biggest innovation in offshore transportation and supply facilities has been in marine equipment—particularly drilling-tender ships. Even before the war, operators were thinking about the kind of ships they'd need when they started operating offshore.

Pure Oil Co., according to L. W. Alcorn, division production engineer, was thinking in terms of building smaller, less expensive platforms, and designing drilling tenders. After the war, though, Alcorn attended a U. S. Navy exhibit at Beaumont, Tex., where some 200 LST's (landing ship, tanks) were docked. The Navy was offering them for $75,000 each, about 1/15 the cost of building such a vessel from scratch. Pure bought one, towed it to a shipyard, and had it converted to a tender.

Shortly afterward, Humble Oil & Refining Co. purchased 18 of the ships, The California Co. and Stanolind Oil & Gas Co. bought 10 each, and Magnolia Petroleum Co. and Kerr-McGee Oil Industries, Inc., invested in Navy YF barges.

As this tender-ship idea progressed, operators began actually to rebuild them, rather than "convert" them. As a result of all the modifications over the ensuing years, a whole new idea on what a ship should have as a platform tender evolved.

The CATC Group and Gulf Oil Corp. have led the way in new tender-ship design. Gulf took delivery on the first such new vessel about a year ago. Then the CATC Group ordered four brand-new vessels from Levingston Shipyards, at Orange, Tex. Each of them cost more than $1.5-million, and they can operate in waters up to 150 ft. deep. Numerous innovations have been built into these ships. Each has its own helicopter-landing deck, improved radio and radar facilities, air-conditioned crew quarters, and safety devices.

The first barge planned especially

SUBMERSIBLE BARGE, owned by American Tidelands, Inc., can move from location to location quickly, affording considerable savings, since no permanent platforms are necessary. Such equipment can operate in waters up to 45 ft. deep.

for offshore delivery of bulk or packaged drilling mud is now under construction for the Baroid Division of National Lead Co. It is scheduled for commissioning in October. The craft will cost more than a quarter-million dollars, and will be equipped with diesel engines, fore and aft, for maneuvering purposes. It will have 50,000-lb. line-pull winches at each end, and will be towed to within 50 yd. to 100 yd. of an offshore drilling rig, then cast loose. Lines from the winches will be "shot" to the rig. With its winches and engines pushing and pulling against each other, the barge can be maneuvered with exceptional facility into just the right loading or unloading position.

A bulk storage groove runs the length of the craft, with platform decking on either side for sacked or canned mud. The bulk handling machinery aboard the barge will pump dry, powdered mud to the rig through a 6-in. rubber hose.

Most of Baroid's mud is now delivered offshore in 5,000-lb. steel cans because the paper sacks normally used ashore break too easily for offshore platform stacking.

Floating equipment is now available for just about every kind of job offshore.

A "perfect boat" for offshore servicing is even in the works. Sea Services, Inc., Harvey, La., was formed for the single idea of building the "kind of boat the offshore operators are waiting for." Its president, H. W. Henderson, resigned last January as marine superintendent for Kerr-McGee, to take the post.

Henderson felt that obsolete LST's and barges were tying up thousands of dollars of operators' money in long-term contracts, yet weren't filling the bill. He now has two cargo carriers in the works, and has financing and plans drafted for eight more this year. He says his boats fulfill the two chief criteria for offshore oil-operations work: (1) They'll be big enough to withstand frequent foul weather; and (2) they'll be maneuverable enough to dock safely in bad weather.

The boats are 135 ft. long by 32 ft. wide by 10 ft. 6 in. deep. Unloaded, they draw 6 ft. of water; loaded, 8 ft. 3 in. Powered by two 600-hp. diesel marine engines driving twin screws, they're of all-steel, welded construction, and will be among the most versatile work boats offshore.

They'll be able to service as many as three drilling rigs within 12 mi. of each other—an appealing economic factor to companies interested in pooling costs. Capacity of the boats is 3,200 bbl. for water, or 45,000 gal. for fuel. There will be sufficient deck space to carry two stacks of drill pipe, or other equipment and material.

Planning of shore installations has developed into a definite pattern.

One of the major problems facing the offshore operator has been a lack of good shore bases, particularly off Louisiana. Such a facility has to have docking space for the various ships needed to ply between location and shore, and it must be reasonably close to operations.

Humble Oil & Refining Co. has the largest, most complete offshore base on the Gulf, at Grand Isle, La. The field offices were recently enlarged, and there are provisions for all spare parts. Elaborate radio communication facilities, complete with huge antennae, handle ship-to-shore messages. The field camp contains modern housing for the workers, and they have the privilege of buying land and building their own homes if they wish. The Grand Isle camp also has modern heliport facilities, since Humble is a big user of helicopters in crew transportation.

Helicopters have entered the offshore play and are destined to stay. Several companies have been formed along the Gulf Coast to handle the transportation of men and light equipment to the base camps and offshore locations. Most new drilling platforms have helicopter landing decks built in, and the newer drilling tenders have them incorporated right in their design. Some of the LST's have been converted to take helicopters.

A lot of other new developments are in the works. Some of them will begin to crop up shortly. Others will have to wait until offshore conditions change enough to warrant them. Among them:

An independent electronic firm is confident it can place into service, within a short time, a homing device that could be located permanently on an offshore rig. The instrument would throw out an electronic beam which a boat, equipped to receive it, could follow directly to location in the worst kind of weather. It would be effective within a 90-mi. radius.

LORAC (long-range accuracy), one of the radar-base navigational aid systems, operates at present from shore-based stations. Its electronic signals triangulate swiftly and precisely to locate boats up to 75 mi. at sea. It is ready to move as far to sea as necessary, operating from offshore platforms, whenever the industry shoves far enough out to demand it.

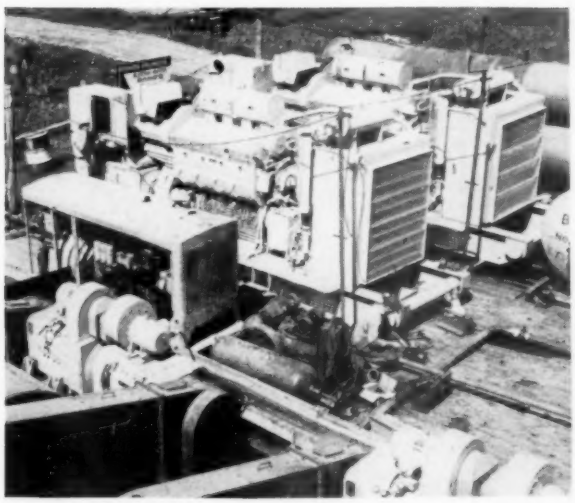
Tucker, Jackson & Co. of Houston has just been formed to furnish a technique for underwater completion and subsequent workover of wells. The firm is still seeking some patent rights, and won't discuss details of the system. But it will work generally like this:

In completing the well underwater, skin divers will be directed by the drilling foreman on the surface by means of television. Each Christmas tree will be fitted to receive a large caisson for subsequent workover jobs. The Christmas tree will be located about 60 ft. underwater, regardless of ground depth, because that is the area of least turbulence at sea.

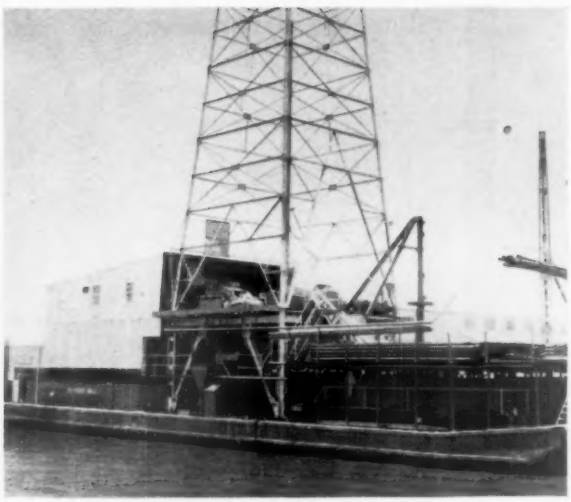
For workovers, a large caisson will be towed to the well, lowered over it, and the water will be pumped out. Then the workover crew will be able to work within the shell below the sea surface.

Reprints Available

Reprints of this entire report are being prepared and will be made available early in September. Single copies will be sent to Petroleum Week subscribers on request without charge. Additional copies will be available at 25¢ each. On orders for 11 or more, quantity prices will be quoted on request. Address orders to Editor, Petroleum Week, 330 West 42nd St., New York 36, N. Y.



Diesel generators on land . . .



. . . and offshore are offering . . .

A New Concept in Rig Power

Drilling rig power, long supplied primarily by steam and diesel plants, has a new source at its command—diesel-electric power. From the looks of things, the new system is tailor-made for deep hole drilling.

General Motors' Electro-Motive Division and Alco Products, Inc., both are now offering diesel-electric units for commercial use. Each has a sample unit in actual operation for commercial use (see pictures above).

Both companies concede that their power units will find little use in shallow wells. Diesel-electric power is better adapted for power-consuming deep hole operations because of its high initial costs.

A shrinking market for railroad motive power caused diesel manufacturers to turn to new fields for sales. Rig power is one of these. Several years ago, GM turned out 10 or 12 railroad units daily. Today's production is two to four units. Alco has had the same experience. By retailoring their plans for oil industry and other nonrailroad units, they hope to get back to their former volume.

Basically, the oil industry units are the same as those used in diesel locomotives, but adapted and "packaged" for oil well drilling. Units range from 550 hp. to 1,700 hp. They are skid-mounted, complete with generators.

Direct-current electricity is generated by the diesels and supplied through control cabinets to electric motors, which operate mud pumps, draw works, and rotary table. The standard package is two diesel-electric units, but other units can be added. Parts are standard and can be replaced easily.

Offshore operators are among the first to try the new units, because the units fit on barges much more easily than conventional power sources. Offshore Co., of Baton Rouge, La., has ordered two GM units, after first trying one out on an onshore operation (left picture, above). Offshore's first unit started drilling in June, but the hole proved dry. Phillips Petroleum Co. converted a steam rig to GM diesel-electric, and was due to start drilling with it last week.

Alco put its first unit aboard the "Henry Bell," a Bateman Drilling Co. barge (right picture, above). The "Henry Bell" is drilling in shallow water off Louisiana.

GM says Offshore Co. "seems to be enthusiastic" about the diesel-electric unit it has used. Offshore is expected to start another well with its land-based unit.

Here are some of the details of diesel-electric units now in operation:

GM's powerplant for the Offshore unit consists of two 8-cylinder, 875-hp. diesels supplying direct current to Electro-Motive D39-series wound motors.

Alco's power for the "Henry Bell" is supplied by two 6-cylinder, 800-hp. engines, model 251. Both engines have turbosuperchargers. They supply direct current to Elliott motors.

The rig on the "Henry Bell" can bore to 15,000 ft. The barge is 180 x 40 ft., and draws 4 ft., 6 in. of water fully loaded. It is equipped with an Emsco steam-type draw works with two Gardner-Denver mud pumps.

Manufacturers point out these advantages of diesel-electric power: fewer units in power transmission, flexibility of movement and power, simplified control, and savings in fuel costs.

Two, instead of six to eight, speed ratios are used by diesel-electric units. Friction clutches and gear compounds are eliminated when diesel-electric power is used.

Diesel-electric units are easy to move because the whole unit comes in a compact package; no assembly or disassembly is needed. Electric power is more flexible than mechanical power for this reason: The diesels run at a constant speed to generate electricity and motor speed on the draw works, mud pumps, etc., is changed by merely shifting the power intake controls up or down. The driller can do this at his control stand. Mechanical power, however, must be shifted through gears to change speeds. The package unit is designed so that one engine can run the whole works if the other conks out. It would be on reduced power, however.

Diesel-electric units are controlled "push-button" style. The driller handles the power for the whole works

who is this guy?

This is the man who makes the fabulous Southwestern petroleum industry tick! Whether he's doing a rough and rugged job in the field . . or whether he has come up through the ranks to the presidency of his company . . he's a sort of composite spirit of the men who drill for and produce oil and gas.

Joe Roughneck is the No. 1 boy in the great Mid-Continent region where 75 per cent of the nation's crude oil is produced. To help him do a better job, Lone Star's completely integrated steel mill was built right in the middle of Joe's workshop, and today, Lone Star is turning out API casing, tubing and line pipe for his special convenience in getting the job done!

Neighbor, wherever you are . . specify Lone Star and we both get a good deal!

Lone Star STEEL COMPANY

LSS

EXECUTIVE-SALES OFFICES
W. Mockingbird Lane at Roper • P. O. Box 8087 • Dallas, Texas

DISTRICT SALES OFFICES
Houston, Texas | Midland, Texas | San Antonio, Texas
Tulsa, Oklahoma | Wichita Falls, Texas | Shreveport, La.

from a control console right at the draw works.

Makers estimate fuel costs will be cut by 10% to 20%. This is because only two speed ratios are involved and several transmission components have been eliminated. The two speed ratios permit quicker power shifts, a saving in time, and hence in fuel consumption, over the old gear-shift system.

The one big drawback to diesel-electric power is its high initial cost. Units will range from $180,000 to $325,000, about double the cost of other power units. But manufacturers point out this offset: By buying a package, operators don't have to engineer and assemble components themselves. This brings the cost relationship a little closer in line.

One representative of a southwest oil company, now using diesel-electric units in offshore operations, confirms the fact that initial cost of diesel-electric is higher than other types. But, he adds, its portability and its adaptability to offshore operations may offset the initial cost.

Alco says its units will "show a two- or three-day saving in each rig move" compared with a diesel-mechanical rig of comparable power. For diesel-electrics, the only work involved is connecting power cables, and motor chains or V-belts.

Sales are in the ice-breaking stage right now. GM hopes to sell between 25 and 50 units in the next 12 months. ALCO hasn't announced its target yet.

Evidently Alco's package unit made a hit with its first customer. E. G. Bateman, president of Bateman Drilling Co., had this to say last week about the unit on the "Henry Bell":

"We are very happy with the rig. We like the whole setup. The diesels have been operating extremely well, and all other functions have been smooth. The equipment layout is very satisfactory. We had only 12 hours of down time through our entire operation; that's extremely low for a new rig. We got faster drilling with lower fuel consumption than with a comparable mechanical rig. To sum it up, the 'Henry Bell' has more than met all our early expectations."

The well is E. P. Brady No. 1 in southeast Bayou Perat (in the Mississippi River Delta) being drilled by Bateman for the California Co. The rig started drilling July 12; got to the contract depth of 10,500 ft. on Aug. 2; then went on day rate. Of the 21 days to Aug. 2, 19 were actual drilling, the other two were spent on coring, Schlumberger, etc.

What's New / IN PRODUCTION

Illinois Unitization Starts

Shell Oil Co. and associates have started surface construction on their Centralia (Ill.) unitized field. The group hopes to produce 109 wells from water injection on the 1,900-acre unit. Shell, 12 other oil operators, and nearly 240 royalty owners are involved in the unit.

Refinery Engineering Co., of Tulsa, is working on the unit's surface facilities. W. H. Burke, Shell Oil Co. production manager at Tulsa and chairman of the Centralia unit operating committee, says the following facilities will be built:

Injection and flood return system of 53 miles of pipeline; central oil treating and oil storage plant of four 5,000-bbl. tanks, and a central water treating and injection pump plant. Burke says the field will also use automatic well-testing facilities for better control and operations.

The flood program will have 99 injection wells and 109 producing wells on a 20-acre, 5-spot-reverse flood pattern—that is, one injection well on each corner of a 20-acre plot and one producing well in the plot center.

Initial flood requirements for the Benoist and Cypress formations are estimated at 15,000 bbl. daily. At present, salt water produced with oil from the Devonian reservoir will be used. This will solve the formation's salt water disposal problem.

•

The Oklahoma Land Office will stage one of its biggest lease sales Sept. 12 at Oklahoma City. Some 397 tracts in 20 counties will be subject to sealed bid offerings.

The largest block of leases is in the Oklahoma panhandle, with 307 tracts comprising 42,563.66 acres in Cimarron County and 16 tracts in Beaver County. The Cimarron area is the largest ever offered at one sale in any Oklahoma county.

•

The first tidelands wildcat to be drilled in federal waters off the South Texas coast is well underway.

Atlantic Refining Co. and Tide Water Associated Oil Co. report their No. 1-726 Federal, 35 mi. east of Corpus Christi, has passed the 3,000-ft. depth. The drilling barge "Mr. Gus" (page 17), operated by Glasscock Drilling Co., is sinking the well in 80 ft. of water in the center of a 25,920-acre block due east from Port Aransas. The wildcat also will be used for refraction seismographic work.

•

A new oil pool in Lea County, N. M., has been opened by Sunray Mid-Continent Oil Co. and associates about 3½ mi. southeast of the Gladiola pool.

The discovery well, No. 1 O. E. Fulton, Sec. 6, 13s, 38e, flowed oil at a rate of 942 b/d in a 12-hr. test through a ½-in. choke. Tubing pressure was 325 lb. Some 500 gal. of mud acid started the flow in perforations in Pennsylvanian lime at depths of 9,688-98 ft. and 9,705-14 ft. The well was drilled to a total depth of 12,320 ft., but was plugged back to the Pennsylvania formation when Devonian lime at the maximum depth proved dry.

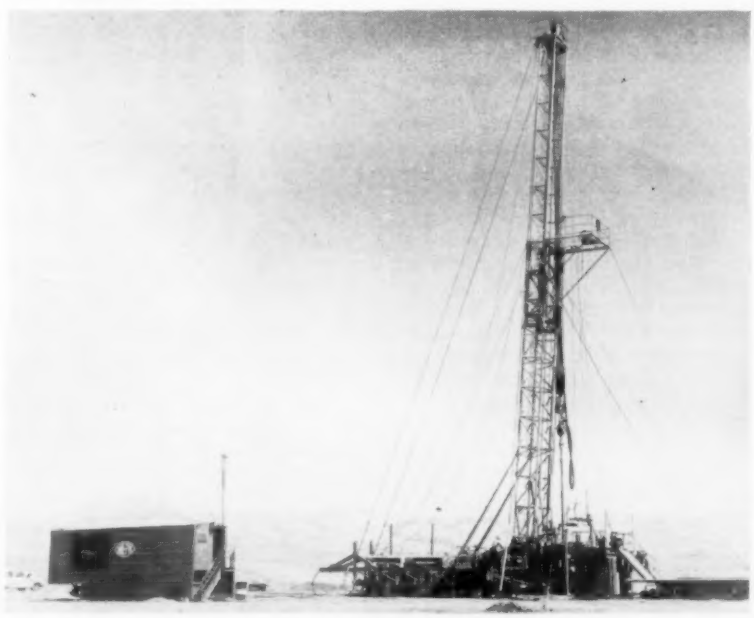
The wildcat is in a 480-acre unit which Sunray Mid-Continent operates. A southeast offset will be drilled.

•

Shell Oil Co. will drill a series of stratigraphic tests on the southwestern flank of the Williston Basin in South Dakota.

Shell, which last year completed the only two producing wells brought in the state, is the second major company to announce a drilling program in the sparsely tested southwestern Williston area. First in the series will be Shell Thompson No. 1, about 15 mi. southeast of Hot Springs, Fall River County. Location is SW NE 2-8s-8e.

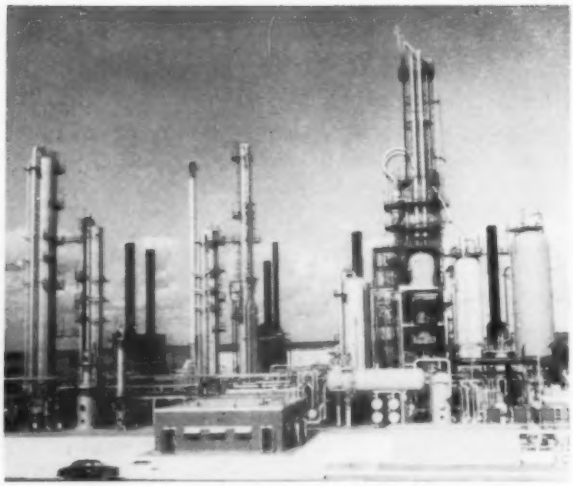
Pure Oil Co., in the meantime, plugged three of a proposed series of six more wildcats in counties in South Dakota (PW—Jul.22'55,p18).



Compact, Mobile Rig Cuts Costs

To meet stiff competition in the contract drilling business, Drilling & Production Co., of Bakersfield, Calif., is using this Cardwell Trailerig, shown on location in McLure Valley. The rig, built by Hopper Machine Works, Inc., Bakersfield, has cut moving costs by hauling in one legal load the equivalent of three previous loads. Air slips and hydraulic tongs on the retractible derrick, in addition to compactness of other equipment, permit complete field operations by a three-man crew. Total dimensions of the unit, packed for moving, are 35x8x13½ ft. This includes an 8x18-ft. mobile doghouse (for crew shelter and tool storage), supply and generator room, 2,000-gal. fuel tank, and a 170-bbl. water tank.

GULF'S large (29,000 b/d) reformer at Port Arthur and . . .



CITIES SERVICE'S smaller unit at Lake Charles show how . . .

Versatile Cat Reformers Are Growing

U.S. and Canadian refiners are betting an estimated minimum of $390-million that catalytic reforming will prove to be the most versatile tool yet designed for the petroleum industry's manufacturing operations.

Proof of this can be readily seen from the rapid acceptance accorded the new cat reforming processes. The first commercial reforming process was announced only six years ago. And already 124 units are in operation in the U.S. and Canada, 62 additional units have been scheduled for construction, and another 14 units are reported under consideration. Other reformers are being built abroad.

Total charge capacity now in operation in the two countries is 914,100 b/d (885,700 b/d in 116 units in the U.S.). Capacity now under construction or definitely planned totals 388,300 b/d (344,700 b/d in 53 units in the U.S.). By the end of 1956, an estimated 1,295,000 b/d of reformer capacity will be on stream—just seven years after this tool was first made available to the industry. By way of comparison, the first catalytic cracking unit—the "workhorse" refining tool—was installed in 1936, and it was not until 10 years later that installed capacity reached 1-million b/d.

Catalytic reforming means much more to the petroleum industry than just a method for making higher-octane motor fuels—which was the primary reason for the development of the 12 competitive commercial processes now available.

For refiners, a wide application of cat reforming fuels will push them farther into the chemical manufacturing field. It gives refiners a choice of using reforming capacity for turning out high octane gasoline or aromatics, depending on demand and price. And in any case, reforming always turns out large quantities of low-cost by-product hydrogen.

For oil producers, the growth in reforming capacity eventually means reassessment of the economic value of high-sulfur-content crudes that often go begging for a market today. Treatment of these sour crudes with hydrogen from reformers can make such lower-grade crudes just as suitable for processing into high-quality products as "sweet" crude oils.

Marketers, through development of catalytic reforming, will have higher-quality petroleum products and, in coming years, will have improved and wider lines of chemical products available through their oil-company suppliers.

Already a start has been made in this direction. At least one large company, Phillips, sells its fertilizers to consumers through its retail service station outlets.

Primary use of cat reforming over the immediate years will be for the production of high-octane motor fuels in growing volume. This is dictated by the competitive octane race and by estimated future automotive engine requirements for even higher-octane gasolines.

Industry officials estimate that an average octane level of 98 to 99 for premium gasolines can be reached by using cat cracking and cat reforming to the fullest extent now considered possible. But they believe that to produce gasoline above 100 octane, in volume, will require new processes—possibly improved reforming methods, possibly something entirely new. Octane ratings of regular grade motor fuels also are expected to rise, and these, like present premium grades, will require reformate as a component.

Some technological improvements already have been made in reforming processes, aimed at producing reformate of 95 to more than 100 research octane. Other improvements expected to be made in the processes in the future include: desulfurization and other feed preparation steps; use of improved catalysts; single-stage and more severe reforming; combining aromatics and reformate production; reforming and then further treatment of the reformate to improve octane.

In addition to the need to make more higher-octane gasolines, use of cat reformers to make aromatics is expected to increase in the future years. Demand outlook for the three major aromatics — benzene, toluene, and xylene—is extremely bright.

This year's demand is estimated at 555-million gal., of which the oil industry will supply about 286-million gal. (20,000 b/d), or about 50%. By 1975, it is estimated, demand for the B-T-X aromatics will come to 1.4-

billion gal., a gain of 150% over present levels.

Meanwhile production of aromatics from coal hasn't and isn't likely to grow at anywhere near this rate. Aromatics from coal are pretty much a byproduct operation, which is tied directly to output of coke from coal. Petroleum-derived aromatics from cat reforming are a primary operation and output can be geared to fit demand. Present estimates would indicate that the petroleum industry can be expected to supply about 94% of the 816-million-gal. increase in aromatics demand over the next two decades.

Development of new derivatives of these aromatics and new uses for the B-T-X group could result in even more growth in demand.

Currently, 20 cat reformers are in operation in the U.S. for production of aromatics from petroleum. Their total charge capacity, which can be directed in whole or part to aromatics output, is 181,200 b/d.

This doesn't mean anywhere near that much aromatic production, however. Depending on the composition of its feed stock, a reformer will yield roughly only about 50% aromatics—and few, if any, units are operated totally for aromatic production today.

There will be competition for the use of aromatics from petroleum. Benzene, toluene, and xylene have high-octane blending values, and thus are valuable gasoline components. Refiners electing to use reformers to make aromatics for sale as such may have difficulty in meeting quality requirements for motor fuels—particularly as the trend to higher ratings continues. The entire reformate output may be needed at times just for gasoline.

This indicates a coming economic battle between chemical and fuel requirements for reformer output. This will work to the advantage of refiners, permitting them to select operations that will make best economic use of reforming facilities. This will be of greatest benefit to refiners blessed with feed stocks having high naphthenic content—at least until some new processing technique is developed.

The refiner planning large-scale aromatic production will be faced with higher manufacturing costs, since he will need to install recovery and purification equipment not needed in gasoline-making operations. Also, market outlets for aromatics are not ready-made as gasoline markets are, and competition may be stronger in a field in which refiners have had only limited experience.

Should markets for aromatics go sour, refiners always have their ace-in-

Since 1926 . . .

CONSULTANTS, DESIGNERS, AND CONSTRUCTORS OF:

Natural Gasoline and Liquefied Petroleum Plants – Desulfurization Plants – Compressor Stations – Solid and Liquid Dehydration Plants – Pipe Line Pump Stations – Recycling and Pressure Maintenance Plants – Petroleum Industry Process and Construction.

DRESSER ENGINEERING COMPANY

706 South Boston | P. O. Box 2518 | Tulsa 1, Oklahoma

Would you like us to acquaint your friends and associates with PETROLEUM WEEK?

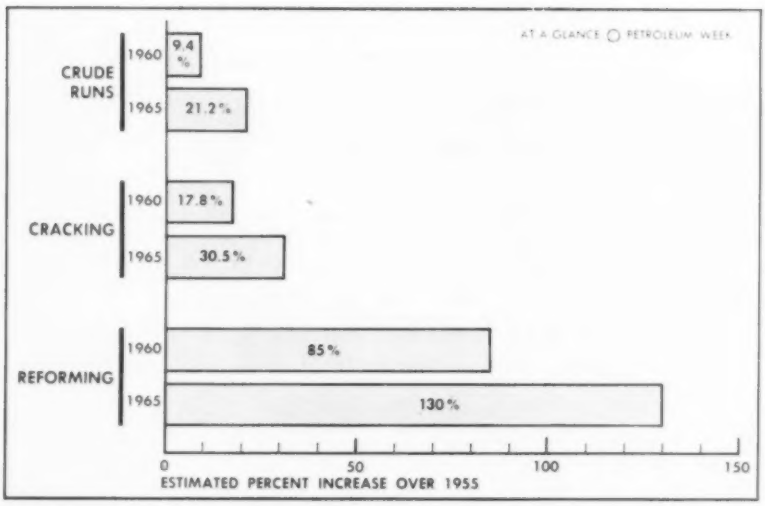
We will be pleased to send a complimentary copy of PETROLEUM WEEK to your friends and associates in the petroleum industry. Just list their names and addresses below, or if the space is insufficient send them along on your business letterhead.

name	*position*
company	*dept.*
address	
city	*state*
name	*position*
company	*dept.*
address	
city	*state*
name	*position*
company	*dept.*
address	
city	*state*
name	*position*
company	*dept.*
address	
city	*state*
name	*position*
company	*dept.*
address	
city	*state*

Please address to Subscription Department

Petroleum Week

330 West 42nd Street, New York 36, N. Y.



CATALYTIC REFORMING CAPACITY is expected to expand 85% over 1955 by 1960 and will show a gain of 130% by 1965. Cat cracking capacity, however, is only expected to record a gain of 30.5% over 1955 during the next 10 years, while the growth in total crude runs to refineries will only expand by 21.2%.

the-hole—the versatility of reformers. They can juggle a few valves and switch to gasoline production.

A big advantage of cat reformers is that they provide refiners with large volumes of byproduct hydrogen at relatively low cost. Already the volume available from cat reformers in the U.S. and Canada is about 500-million cu. ft. daily. Within 10 years, it is expected to grow to more than a billion cu. ft. daily.

There is widespread usage of this impressive output of a byproduct. For instance:

- Within refineries, hydrogen is used (1) for desulfurization, and for improving qualities of feed stocks and eventually of heavy residues and crude oils; (2) for upgrading a wide range of finished products to lower sulfur content; and (3) for manufacturing aviation gasoline and motor fuel components.
- In petrochemical operations, hydrogen is used (1) to synthesize ammonia for nitrogenous fertilizer materials; and (2) with carbon monoxide to manufacture methanol and special alcohols.
- In other industries, hydrogen finds uses (1) in the hydrogenation of fatty oils to eliminate objectionable acids; (2) as a reducing agent in the manufacture of metal powders; and (3) in the small-volume production of miscellaneous chemicals.

Hydrogen-consuming refining processes have been known for many years, but large volumes of low-cost hydrogen were never available to refiners until the increase in reforming capacity.

Wider use of hydrogen is indicated by results of pilot-plant research demonstrating that more severe hydrogenation can be used to desulfurize and improve heavy residues and even the high-sulfur crudes. The economic incentives for treating these crudes and heavy feed stocks include the reduction of refinery operating and maintenance costs as well as the improvement of product quality.

Mild hydrogenation in upgrading finished products is finding wide usage in improving storage stability of motor fuels without loss of octane value, increasing octane numbers of cracked diesel fuels, and improving burning qualities of kerosine and light distillates.

The most practical and economic outlet for cat reformer hydrogen appears destined to be its use within refineries in processing and treating products. This promises to be true regardless of how large the volume of hydrogen output becomes as cat reforming expands. Some estimates are that refinery use of hydrogen will become so great that refiners will eventually become buyers of this material even beyond the huge quantities available from reforming.

The factors that throw the economic balance in favor of the use of hydrogen within refineries include the fact that it can be used in most desulfurizing and upgrading operations just as it comes from reformers. Also, the volume of hydrogen available will be roughly in proportion to the volume of the feedstocks and finished products that need to be treated.

What's New
IN REFINING

Now it's The Texas Co. that's planning to build a refinery on the Pacific Coast, according to a report which Texaco would not discuss this week. The site has not been determined, according to the report, but is more likely to be in Washington or Oregon than in California. General Petroleum's new refinery at Ferndale, Wash., went on stream last November; Shell's, at Anacortes, Wash., will go on stream this fall.

•

Northwest Nitro Chemicals, Ltd., is near the construction phase of its plan to convert Canadian natural gas into fertilizer for marketing in the prairie provinces of Canada and in northwestern U. S.

The firm, financed by chemical, oil, and pipeline interests, has awarded contracts for a $23-million fertilizer plant near Medicine Hat, Alta. Preliminary work is underway on a 46-mi., 10-in. natural gas pipeline to the plant from Etzikom field.

Canadian Kellogg Co. will build ammonia, sulfuric acid, and nitric acid units for the plant. Fluor Corp. of Canada will build a phosphoric acid unit. Ford, Bacon & Davis, of New York, are prime contractors. Completion is scheduled for late next year.

Northwest Nitro is controlled by Commercial Solvents Corp., N. Y., with substantial interest held by New British Dominion Oil Co., Ltd., of Calgary. Also associated in the venture is Frank M. McMahon, of Calgary, president of Westcoast Transmission Co. Permission for the pipeline is held by South Alberta Pipe Lines, Ltd., owned jointly by New British Dominion and Midcon Oil & Gas, Ltd., Toronto. Northwest Nitro is negotiating with Shell Oil for purchase of sulfur from the latter's new Okotoks gas field, 20 mi. south of Calgary.

•

McColl-Frontenac Oil Co., Ltd., Montreal, has placed on stream the first combination UOP Platforming-Unifining Unit to go into operation outside the U.S. Standard Oil Co. of California, meanwhile, opened one of two similar units in California.

The McColl-Frontenac unit has a design capacity of 11,970 b/d. The completed Standard Oil Co. unit, at Richmond, is rated at 22,000 b/d. The other unit is under construction at Standard's El Segundo refinery.

All business is specialized

. . . and nothing specializes on <u>your</u> business like your business paper

Here's a smart business man. He spends his time where every sitzmark parks a prospect at his feet. It's simple sense: He *specializes* . . . and it *pays*!

Your business is specialized, too . . . and so is your business paper. The time you spend with it pays . . . for its editors are experts in your specialty. They scout the field . . . report what's good that's new . . . find ideas that worked . . . suggest methods to keep you a leap ahead of competition.

The ad pages are as specialized as the editing. They, too, tend strictly to business . . . your business. They bring you data on new products, new materials . . . gather in one place a raft of ideas on where-to-buy-what, or how to make (or save) a dollar.

That's help you can't find concentrated into such quick reading time *anywhere* else! It's help that puts many a man out front in his field, as a specialist who knows what's what today . . . sees what's coming tomorrow. It's simple sense to read every page, every issue.

This business paper in your hand has a plus for you, because it's a member of the Associated Business Publications. It's a paid circulation paper that must earn its readership by its quality . . . And it's one of a leadership group of business papers that work together to add new values, new usefulness, new ways to make the time you give to your business paper still more profitable time.

A copy of this quick-reading, 8-page booklet is yours for the asking. It contains many facts on the benefits derived from your business paper and tips on how to read more profitably. Write for the "WHY and HOW booklet." Room 2710.

McGRAW-HILL PUBLISHING COMPANY
330 West 42nd St., New York 36, N. Y.

One of a series of advertisements prepared by THE ASSOCIATED BUSINESS PUBLICATIONS

Transport changes and new refineries are . . .

Nailing The Lid on Group 3 Pricing

A Bureau of Mines report issued last week, gives spot emphasis to a major evolutionary change in the oil industry—the decline of Group 3 (Oklahoma) as the standard for pricing in the Midwest.

The bureau's figures show that Oklahoma refineries in operation on Jan. 1, 1955, had a crude oil capacity of 352,100 b/d—a total surpassed by eight other states. But 36 years ago, Oklahoma was second in the standings, topped only by California. Oklahoma refinery capacity today makes up only 4.4% of the nation's total. In contrast, back in 1919, when Group 3 was at its height, Oklahoma refining capacity was 18% of the total for the entire United States.

Actually, the total throughput capacity of Oklahoma refineries is higher today than it was then—352,100 b/d this year, only 233,300 b/d in 1919. But the increase falls woefully short of matching the 500%+ rise in the country as a whole—from 1.3-million b/d to 8.1-million b/d.

The key fact revealed by the B of M figures is that refinery capacity in the area around the big Great Lakes consuming centers—in Illinois and Indiana, for instance—has increased in importance in direct proportion to Oklahoma's decline. And these Great Lakes consuming centers used to be supplied almost exclusively from Oklahoma—on the basis of Group 3 prices. Illinois' throughput capacity has risen from 46,000 b/d in 1919 to 510,400 b/d today; Indiana's has increased from 36,500 b/d to 424,000 b/d.

Basically, it was steadily rising rail rates that did it. But it has gone beyond that now. Today, prices based on Group 3 (f.o.b. Tulsa), plus transportation, have been so high that even a switch from railroad tank cars to cheaper means of transport has not stopped the trend away from Group 3.

Prices at consuming centers generally tend to vary in accordance with corresponding differences in transport costs. And transport costs are not measured simply by distance. Generally speaking, ocean tanker costs per mile are less than pipeline costs, and pipeline costs per mile are less than railway tank car movement.

But, usually, the more distant a market is from its source of supply, the more it will pay for its oil products. Hence it was virtually inevitable that, in the course of time, Group 3 would fail as a pricing base. Northern refiners, located near their markets, could quote well under the Group 3 posting, plus transportation, and still make a profit. Group 3 refiners, on the other hand, had to suffer losses, shut down, or find new markets for their products. The cost of moving their products to the profitable northern areas was too high, in most instances, to permit any other course of action.

The same factors which touched off the passing of Group 3 as a pricing structure have had marked effect on all segments of the petroleum industry throughout the Midwest:

• Producers have stepped up their efforts to find new sources of crude in locations better suited to changing market patterns. Witness, for instance, the heavy activity in the Williston basin in North Dakota and Montana. Canadian fields just over the border also are being tapped, with new pipelines and refineries being built in the region to handle the new crude.

And producers in Oklahoma have been forced, by the failure of Group 3 refining capacity to keep pace with increases in crude production, into a tough competitive search for markets, and for cheaper means of moving their crude to refineries farther north. Today Oklahoma produces around 550,000 b/d of crude, nearly twice as much as its refineries can handle. Back in 1919, the state's refineries imported crude; production was only about 35% of refining capacity.

• Refiners have turned to areas heretofore considered inappropriate as sites for refinery construction. Crude pipelines and barge movements have made it economically feasible for refiners to move farther away from producing fields, and closer to markets, since the savings in finished-products shipment more than offset the higher costs in obtaining the crude.

The trend toward building of refineries in historically suitable locations has not been confined to the Midwest. There is bustling activity now in the Pacific Northwest, New England, and the Southeast—areas far removed from crude sources. New pricing patterns could emerge in these areas, too, in a manner roughly parallel to the Group 3 story.

• Transporters have built, and are building, a new, giant network of pipelines, barge lines, and tank wagon delivery systems. But the railroads have continued to lose in the fight for oil products shipments.

• Suppliers have found terminal pricing more realistic. Savings effected by cheaper transportation and market-location refineries have enabled them to maintain profit margins and to keep customer prices low despite other higher-cost factors.

Only in residual fuel has Group 3 held its own. But new refining techniques aimed at reducing, or eliminating, output of resid are nailing the final lid on Group 3 pricing.

Shipment by tank car is still the most practicable method of transporting resid, which is too viscous and slow-moving for pipelines. But tank car shipments of resid to distant locations are so expensive that, in many instances, it can't compete economically with fuel oil produced at local refineries.

Mid-Continent companies have learned that the easiest way to avoid such uneconomic shipments is to turn out less heavy fuel, or none at all. Cat cracking and visbreaking processes, though yielding some resid, cut heavy fuel output considerably (PW—Aug.5 '55,p23). And coking plants eliminate it entirely.

Group 3 began as a rail rate system set up for Oklahoma and was designed to give that state's refiners a competitive chance with northern processors.

The rates were set up in 1916 when the railroads recognized the need for cutting rates from the Mid-Continent to lucrative northern markets.

The northern refiners obtained their crude by pipe line. As a result they were able to process oil and ship to customers at a considerably lower over-all cost than Mid-Continent processors, hamstrung by the comparatively heavy rail rates, were able to do. (There were no product lines then.)

Tulsa, as the oil capital of the Mid-Continent, became the focal point of Group 3. Prices quoted at that city

were used as standards in computing prices for products throughout the Midwest.

By the Group 3 method of pricing, all shipments of products from anywhere in Oklahoma to a destination outside Oklahoma carried the same freight rate.

Marketing men in the Midwest had been quick to seize on the Tulsa f.o.b. point of origin as a means to bring some order to otherwise chaotic conditions that existed prior to the fixing of Group 3 rates by the ICC in 1916.

But when the bulk of Mid-Continent crude and refined products began moving north by pipeline or river barge, a pricing system founded on rail rates became more inadequate with each new development, each passing year.

It has been estimated that 90% of oil products shipped from the Mid-Continent moved via tank car in 1915. Today perhaps less than 5% moves over the rails, and nearly all of this is heavy fuel.

Mid-Continent refiners gave Group 3 a heavy blow themselves by constructing the Great Lakes pipe line in 1930 for shipment of refined products.

The switch from Group 3 to various types of destination, or terminal, pricing was gradual, and roughly proportional to the decline in importance of Mid-Continent oil as price-setter in the Midwest.

In addition to the tremendous growth of refining capacity in Illinois and Indiana, as well as other north Midwest states, the Gulf Coast has grown to the point where it now has, roughly, one-third the nation's total refining capacity. The Bureau of Mines report shows that Louisiana, for instance, has a total refining capacity of 643,500 b/d. This compares with 67,925 b/d in 1919.

Though Gulf operators are even more distant from Midwest markets than Oklahoma, they have overcome the geographical handicap by developing low-cost barge systems to move their products to principal consuming areas along the Mississippi and its tributaries. They also took over virtually the entire Gulf area market.

This shakeup in supply and distribution patterns inevitably led to a shakeup in the pricing systems.

Perhaps the heaviest blow dealt to Group 3 was the Standard Oil Co. (Indiana) decision to abandon it as a pricing system, about six years ago. In its stead, Standard of Indiana adopted a pricing system based largely on local competitive conditions. Base prices were set for various terminals, with prices to jobbers determined by adding tank wagon margins, in most cases, from the new basing points.

As a specific example of what actually has happened in the Midwest so far as Group 3 base-point pricing is concerned, compare today's prices for No. 2 fuel at Minneapolis-St. Paul with what they would have been under the old system.

Prices for No. 2 fuel at Twin Cities docks last week were 9.625¢; 9.928¢ delivered to jobber storage. This same gallon of No. 2 fuel, if it had been sold on the old basis of Group 3 plus rail freight to the Twin Cities would have cost the jobber 11.657¢ at his bulk plant siding, or roughly 1.75¢ more per gal.

What's New / IN MARKETING

A new development in the tire-retreading business may put a dent in the oil industry's tire market. Oil marketers merchandise roughly one-third of the new tires sold throughout the country.

The National Assn. of Independent Tire Dealers has adopted a set of tire retreading standards and specifications to be promoted on a nation-wide basis. Two years of effort by tire manufacturers and makers of retreading materials and equipment went into the new code, which is designed to insure uniform quality and performance of retreads.

When and if the new code gives more volume and prestige to the retreading business, any drop in new tire sales is sure to be felt in oil industry outlets.

•

A Federal Grand Jury sitting in Boston is slated to investigate possible price-fixing within the oil industry in Massachusetts.

U.S. Judge William T. McCarthy said at impaneling of the jury last week that it was convened at the request of the U. S. Justice Dept. Antitrust Division to check price practices of major oil companies and retail outlets in the district.

The panel will also hear testimony relating to marketing of rolled gold plate, concrete pipe, and pipe machinery. The grand jurors were told the inquiry may be long, running into months.

•

Midwest Oil Co., Minneapolis, will start distributing Tide Water Associated Oil Co. products on Jan. 1, 1956. The firm will continue to market its present brand, Ace products.

Midwest will handle Tide Water gasoline, motor oils, lubes, diesel fuel, and home heating oils in Minnesota, the Dakotas, western Wisconsin, and northern Iowa.

Two more service station operators are being sued as a result of California's price war. Both defendants are San Bernardino retailers.

The California Petroleum Marketers Council charges that Jim White and George Roy, operators of Roy's Hancock Service Station, and Tulsa, Wichita & Abilene Oil Co., operator of a multipump station, have sold gasoline below cost of the product. California laws do not fix prices but prohibit cutting prices below the amount paid by the retailer.

The complaints are similar to an action taken by the council's predecessor, the California Petroleum Distributors Assn., against Hudson Oil Co., Bakersfield. The association obtained a restraining order against Hudson pending a trial, date for which has not been set yet.

The price war has affected the gasoline market as far away from San Bernardino as Pasadena. The price of regular grade gasoline in San Bernardino has been an average of 13.9¢ among independents, with some recent markings as low as 10.9¢. The figures are exclusive of 8¢ state and federal taxes.

•

Shell Oil Co. will realign its marketing operations involving lubricants, fuel oil, liquefied petroleum gas, and special products. Two new departments will replace three now in existence.

A newly formed industrial products department will handle marketing of lubricants and all special products except LP-gas. It will be headed by B. G. Symon, current manager of the lubricants department.

Fuel oils and LP-gas will be handled in a department to be headed by J. L. Minner, now fuel oil manager. A West Coast fuel oil-LP gas office will be managed by C. B. MacGlashan, manager of Shell's West Coast fuel oil department.

What Is Interstate?

An Interstate Commerce Commission hearing examiner is due to rule soon on whether petroleum product reshipments made within a state are subject to federal control if the products originally came from outside the state.

The deadline for filing briefs by interested oil companies and other officials is Aug. 15. After that, ICC Examiner R. E. Brady will hand down his decision.

Three motor carriers — Refiners Transport & Terminal Corp., Hugh Breeding, Inc., and Commercial Transport, Inc.—have asked the commission to clear up, once and for all, the question of who controls carriers in this traffic.

Some carriers have filed for interstate operating rights. Others, afraid they will be squeezed out if they don't get the same authority, have followed suit. As a result, ICC has been flooded with hundreds of requests for certification without being sure whether it, or the states, should control these carriers.

If ICC should hold such shipments are interstate, it will mean that hundreds of carriers will come under ICC jurisdiction, with all its attendant regulation.

Such a holding will mean that all carriers now hauling these products will have to get interstate operating rights. If this happens, oil companies say they are afraid they might be left without sufficient tank trucks to haul their products, since many of the carriers might decide to drop the traffic rather than try to get an ICC license.

Rates, too, would shift from an intrastate to an interstate basis. And although they probably would wind up at about their current level, there would be a period of jockeying with ICC on these. ICC control also would entail keeping of driver's logs, regulation of hours of service, and other requirements.

Reshipment of out-of-state oil which has first come to rest in in-state tanks or terminals has been considered intrastate traffic, with few exceptions, ever since the U.S. Supreme Court ruled on the problem in a 1927 case.

In the 1927 case—Atlantic Coast Line RR. vs. Standard Oil Co. (Ky.)—oil was shipped to Florida from Texas by ship, and later reshipped from storage terminals by tank car to points within the state. The second movement was held to be intrastate commerce. The gist of the ruling was that the oil had "come to rest" within Florida before its reshipment.

But in two recent decisions, the Supreme Court raised some doubts about the basic question and asked ICC to study the problem and return a finding.

The court ruled tentatively in the two cases, that truck movements out of pipeline terminals are in intrastate traffic. But it made the decision subject to the findings of the ICC investigation. On June 13-14, oil companies, state officials, railroads, motor carriers, and pipelines came before the commission to state their positions.

The spokesmen, without exception, argued that such shipments are intrastate commerce. They stated that movement beyond the terminals was a new movement and not part of the interstate flow which began at the refinery in an outside state.

If ICC decides such shipments are interstate traffic, it seems sure the matter will be appealed.

What's New / IN TRANSPORTATION

The Port Richards oil terminal at Savage, Minn., is scheduled to receive its first shipment of fuel oil early this week. M. D. Richards, president of Richards Oil Co., says the shipment "marks another step forward in the industrial growth of the lower Minnesota River." The newly completed Port Richards terminal has a 2,260,000-gal. storage capacity. It is on the south bank of the Minnesota River, about 15 mi. from the heart of Minneapolis. The first delivery of 1,578,782 gal.—637,389 gal. of No. 1 fuel oil and 941,393 gal. of No. 2 fuel oil—is being towed upstream from Memphis, Tenn. The tow will move 1,080 mi. up the Mississippi, then an additional 14 mi. up the Minnesota.

•

New York City has eased its oil storage laws, giving legal status to some tanks which had been technically in violation of fire-prevention statutes.

Mayor Wagner, however, does not interpret the new laws as forecasting a favorable vote for a pending proposal for an oil terminal on the city's West Side waterfront. He says the revision is a separate measure and reflects neither official approval nor disapproval of the West Side project.

Legal maximum storage now permitted in New York City is 500,000 gal. for each tank of volatile and flammable oils, or 5-million gal. for nonvolatile and non-flammable oils.

Previous legal maximums had been 8,000 gal. to 100,000 gal., depending on the distance of the tank from adjoining property lines. The revision also exempts oil storage plants with a property area of not more than 20,000 sq. ft. from a previous requirement that direct telegraphic communication be maintained with the city's Fire Dept.

•

The Federal Power Commission last week approved a $2-million pipeline and river crossing of the Washington (D. C.) Gas & Light Co. The project is designed to boost services in the Metropolitan Washington area. Washington Gas & Light will build 11 mi. of 24-in. natural gas line and a river-crossing at the Anacostia River.

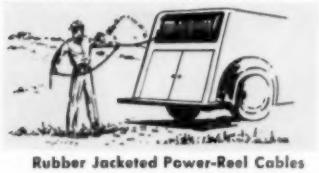
•

Semi-automatic control of pipeline pressure and flow by means of electrical pressure-sensing devices has been provided for handling crude oil on the new 256-mi. Minnesota Pipe Line Co.'s System. The line connects Great Northern Oil Co.'s new 25,000 b/d Pine Bend (Minn.) with Lakehead Pipe Line system from Canada.

Five pressure cells are used at two pump stations on the line to measure suction and discharge pressures. Instrument panel indicators are calibrated to record both pressures in pounds. Use of these devices is said to simplify centralization of instrumentation and eliminates the use of oil lines through control and instrument panels.

No matter how you look at it ...

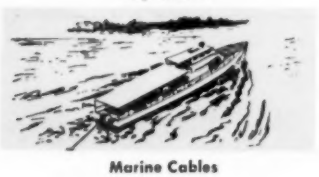
Vinyl Jacketed Power-Reel Cables



Rubber Jacketed Power-Reel Cables

Portable Cables

Bay Cables



Marine Cables

Velocity Cables

Pattern Spread Cables

THERE'S A VECTOR GEOPHYSICAL CABLE FOR EVERY EXPLORATION METHOD AND AREA

From any point of view – that of the client, contractor, operator or helper, seismic operations require cables *engineered* for the application.

Offshore or in the marsh – in heat or cold – there's a Vector Cable designed to meet the requirements of the world's toughest prospects.

When planning an exploration program anywhere around the globe, consult the Vector catalog of field-proven cables and accessories.

Vector **MANUFACTURING COMPANY**

5616 Lawndale Avenue
Houston 23, Texas

Traveling Man... Five days out of seven this man is traveling—he's a Texaco Tank Truck Operator. It's his job to take the gasoline and put it where you can get it . . . to supply the Texaco Stations that supply your car with the finest petroleum products made. You'll see big red Texaco trucks like his everywhere you go. They're always on the move—to make sure that Texaco pumps are always ready to fill 'er up for drivers in all 48 states.

The Texas Company

TEXACO

Countries receiving Soviet-bloc oil this year

	1954 Agreements (Estimated, b/d)	1954 Actual Deliveries, b/d	1955 Agreements (Estimated, b/d)
Argentina	10,270	9,300	10,000
Belgium	6,000	4,200	2,000
Egypt	7,290	5,900	10,000
Finland	24,180	20,500	11,300
France	7,000	6,400	4,800
Greece	...	...	5,000
Iceland	5,300	5,300	6,500
Israel	5,639	4,800	5,000
Italy	13,241	3,500	9,100
Sweden	18,000	13,900	10,000
Yugoslavia	...	...	4,000

Countries that received Soviet-bloc oil last year, which are not getting it this year

	1954 Agreements (Estimated, b/d)	1954 Actual Deliveries, b/d
Denmark	600	600
Great Britain	1,900	700
Germany, West	4,870	8,200
India	770	700
Japan	1,000	1,000
Netherlands	920	6,800
Norway	2,620	2,700
Switzerland	600	1,600

AT-A-GLANCE © PETROLEUM WEEK

Fewer countries get Soviet oil this year as . . .

Red Oil Exports Level Off

Despite considerable publicity on the Soviet bloc's oil-export drive, well qualified oil industry experts believe that oil exports from the USSR and its satellite countries have reached a plateau this year. They expect exports to level off at a point close to, or below, last year's record peak.

Last year's sharp 38% increase over 1953 exports from the USSR and Rumania seems at first to argue against this analysis. Value of 1954 exports was about $150-million, for an approximate 90,000 b/d, according to a recent Foreign Operations Administration report to Congress. Oil hit the top of the Soviet trade list in 1954 for the first time.

But the rate of increase between 1953 and 1954, these oil sources say, can't be considered a guide to what we can expect from here on. Russian oil exports were just starting in 1953. Indications were that only marginal outlets—countries not committed to the West for their oil supplies—were picked up.

To be sure, the Russians have been continuing the energetic sales push they started putting on crude oil and refined products in 1954. Trade missions and export offices are active around the world. Announcements of new trade agreements either concluded or under discussion are hard to keep up with.

Offers of oil—or trade agreements—are one thing, however; deliveries are another. And deliveries fell short of agreements in 1954.

Considering the gaps that often exist between Soviet offers and Soviet deliveries, oil industry sources last year made what they considered to be a realistic appraisal of oil agreements. They sifted down announced commitments to what, in their best judgment, the Reds might actually be able to deliver. They came up with a total of 110,200 b/d to be delivered to 17 customer nations in the free world (table, left).

Actual deliveries by year's end, however, came to only 96,100 b/d. The estimated potential deliveries were met in three out of the 17 countries—Denmark, Iceland, and Japan. In four countries—West Germany, Netherlands, Norway, and Switzerland—deliveries were larger than the oil men anticipated. But in 10 countries, Soviet deliveries fell short—Argentina, Belgium, Egypt, Finland, France, Great Britain, India, Israel, Italy, and Sweden.

Oil experts have now sifted through numerous announcements of Soviet-bloc oil export commitments for 1955. As far as can be determined on a realistic basis, they amount to something like 77,700 b/d so far.

The 1955 total includes only 11 countries (red lines on map). Eight of last year's customers have dropped off the list—Denmark, Great Britain, West Germany, India, Japan, Netherlands, Norway, and Switzerland (black lines on map). Two new ones—Greece and Yugoslavia—have been added.

There have been numerous unconfirmed reports of additional "agreements" that could raise the total figure above the 77,700 b/d the oil men estimate. For example, there are reports of deliveries promised to Japan and West Germany, as well as additional quantities for Argentina, France, Israel, Italy, Sweden, and Yugoslavia. But even allowing leeway for additions, the total would still be unlikely to top actual deliveries made in 1954.

The important thing is that, even with the stepped-up oil-production goals announced by the Soviet bloc, there still wouldn't be enough oil both to meet rising domestic demands and

to maintain a heavy export drive.

Last year's oil exports represented a sizeable share of Russian and Rumanian oil production—but they were at the expense of domestic use. Per capita consumption has been very low. And now a new drive for higher production is being made in the USSR's heavy industry, and in the huge mechanized agricultural collectives.

Oil and gas production is being pushed strenuously in the USSR this year. This year's target calls for 1,400,000 b/d, as against 1,160,000 b/d last year, a 21% increase. It's significant that a former minister of the petroleum industry was appointed recently to head a new commission for long-range planning. The oil output goal, he promised, would be met before the current Five Year Plan ends this year.

Recently the Ministry of the Oil Industry was reported in Izvestia, the official government newspaper, as having fulfilled 103% of its assigned production quota during the first half of this year. This production gain is the largest announced for any annual or semiannual period during the current Five Year Plan.

Rumanian oil production, which accounted for a large share of the Red-bloc exports last year, is also being pushed. The target for the end of 1955 is set at 220,000 b/d. Official statements claim the rate was overfulfilled by 4.3% by the end of the first quarter, nine months ahead of schedule.

How much of the planned increase in Red-bloc oil production might be shifted from domestic requirements to export markets is, of course, anybody's guess. But some of it will only offset the USSR's loss of the Austrian oil fields, which now revert to Austria with final ratification of the Austrian peace treaty (PW—Jul.18'55p28). Last year the Soviet Mineral Oil Administration in Austria produced some 24-million bbl. of oil. Under the treaty terms, Austria will deliver to the USSR 7½-million bbl. annually for a decade, leaving the USSR a net "loss" from that source of about 16½-million bbl.

There's always a possibility, of course, that the Soviets may decide to continue an export drive at the expense of their domestic economy. But that looks rather unlikely at present, in view of current emphasis on buildup of heavy industry and increased agricultural production. There is undoubtedly a double pull, however. On the one hand is the Communists' rising need for oil at home. On the other hand is the fact that they can use oil in export markets, either to acquire needed currencies, or to barter for machinery, transport equipment, cotton, and other commodities.

Syria Issues Oil Ultimatum

SYRIA—Iraq Petroleum Co. has received an "ultimatum" to meet the Syrian government's demands for increased pipeline transit fees by Aug. 24.

The demands, calling for a 50-50 split of pipeline "profits" are not new, but this is the first time since negotiations started in 1952 that the government has given IPC an official communication threatening "action." IPC was given 28 days to comply, and the demand looks like a political gesture timed to coincide with elections scheduled for Aug. 18.

Last February, the Syrian government told IPC it wanted an equal share of the benefits realized by the company through transport of its oil from Iraq by pipeline through Syria, instead of by tanker through the Persian Gulf and the Suez Canal, to the Mediterranean Sea. At that time, IPC reportedly proposed to Syria a royalty of 20-million Syrian pounds annually (nearly $6-million), which is 10 times the royalty being paid now.

The Syrian demand for 50% of pipeline "profits" would set a new pattern for defining profit-sharing rights of nonproducing countries in

Cities Service Speeds Ahead in Dhofar

Work is proceeding rapidly at Cities Service Co.'s first wildcat, Dauka No. 1 (above), in Dhofar in southern Arabia. The well was spudded in May 23 at a site approximately 130 mi. inland from the coast. Fresh water was encountered at 1,000 ft. and cased off (and an adjoining water well promptly put in, thus solving one of the drilling crew's main problems). This week drilling was proceeding below 2,500 ft. Inspecting the drilling (right) are R. V. Whetsel, director of foreign operations for Cities Service Co., and Billie Caver (back to camera), field operations manager. Operations are handled by Dhofar-Cities Service Petroleum Corp. for the joint account of Cities Service and Richfield Oil Corp. The 32,000-square-mile concession for Dhofar province, was acquired last year from the Sultan of Muscat and Oman. An associate of the Iraq Petroleum Co. relinquished its rights to Dhofar province in 1951, but will start its first exploratory well at Jebel Fahud in Oman sometime this winter (PW—Jul.15'55,p29).

oil piped across their territories. If the pattern is set, it would have repercussions on Jordan and Lebanon, as well as on other pipeline operations.

Syria's demand calls for 50% of the differential between the price of IPC oil entering Syria at the Iraq border and the official posted price of that oil at Mediterranean ports, after actual pipeline costs have been deducted.

IPC's agreement with Iraq sets the border value of oil at $2.05 a bbl. for 36-gravity oil. Posted price for this oil at the eastern Mediterranean ports is $2.39. The Syrians are demanding half the 34¢ difference after pipeline costs are deducted.

Last year approximately 25-million tons (187.5-million bbl.) of IPC oil flowed through three IPC pipelines that originate in Kirkuk, Iraq, and cross Syrian territory to Mediterranean ports. One of these is a 30-in. line that passes through Syria to Banias. The other two (16-in. and 12-in.) pass through Syria to Lebanon's port of Tripoli.

The Syrians claim that IPC saves 70% of its total transport distance by piping oil through its territory instead of shipping from Kirkuk to the Persian Gulf.

If Syria successfully presses its new demands against IPC for increased fees, it is likely that it will slap a similar levy on Trans-Arabian Pipeline Co. For Tapline, Syria says, is saving 80% on its shipments out of Saudi Arabia. The two companies together, the Syrians claim, are "earning" at least $140-million annually by transiting through Syrian territory.

Tapline is wholly a transport company and does not sell oil. Its 30-in. line originates in Saudi Arabia at Qaisumah, where it picks up from a 315-mi., 30-in. gathering system owned by Arabian American Oil Co. Tapline carries Aramco oil 754 mi. through Jordan and Syria to the Mediterranean port of Sidon, in Lebanon. Aramco sells the oil, and its agreement with Saudi Arabia does not include any border value. There is, therefore, no "profit" on differences between the Arabian border price and the posted price at Sidon. In the first half of this year Tapline delivered an average of 315,645 b/d of Aramco oil to Sidon, or a total of 55,131,791 bbl.

It is considered probable that Jordan and Lebanon will press similar claims for transit fees against IPC and Tapline. The Lebanese government has been conducting talks with IPC in Beirut on the subject of increased fees, but it is not yet clear whether Lebanon is also aiming at the 50-50 "profit" split.

What's New / ABROAD

Sits on Hopes

ANGOLA — Petrofina, Belgium's aggressively expanding oil group, is trying not to think too big too quickly about its promising oil find in the Portuguese colony on Africa's west coast. The discovery has not yet been completely evaluated, but if appearances are confirmed, its production might turn out to be of primary importance in Africa's oil supply.

Presence of oil was indicated in a wildcat test drilled on a structure that has been mapped as extending 9 mi. by 5 mi. The oil show occurred at a depth of 8,529 ft. in the upper cretaceous limestone. A second well has been spudded, and is expected to be carried to a depth of about 11,000 ft. Current drilling is being done about 25 mi. from Luanda, Angola's capital.

Petrofina has held its exclusive concession on 11,580 sq. mi. for the past 2½ years and has made several exploratory drillings without finding commercial quantities of oil. Geophysical and geological work, being done by Geophysical Services, Inc., of Dallas, is not yet completed.

Petrofina's concession terms permit establishment of a refinery if commercial quantities of oil are developed. Recently the company submitted plans for a 30,000 b/d plant to the Angola authorities (PW—Jul.8'55,p52), but the project is not expected to materialize until Petrofina has evaluated its discovery.

If the Angola discovery develops as Petrofina hopes, it could make a marked change in the company's marketing operations.

Petrofina's present distribution network in Angola, the Belgian Congo, and French Equatorial Africa depends on imported oil products brought to the Atlantic coast by tanker. An important part of the network is a 6-in. pipeline that covers a 217-mi. stretch from Ango-Ango, petroleum port in the Congo estuary on the edge of Angola, to Leopoldville in the Belgian Congo. From there the oil products are carried by tanker up the Congo River into the interior.

•

Seeks Oil Capital

FORMOSA—Several American oil companies are indicating possible interest in Formosa, according to the New York representative of the government-owned Chinese Petroleum Corp. He told PETROLEUM WEEK this week that "at least one major company" and several independents have been in touch with the Chinese Nationalist Government since promulgation of new regulations last winter governing oil exploration and operation on the island.

The regulations provide for one-year prospecting permits. Exploration rights are granted for two years, extendable for a further two-year period, and cover one-half the territory previously approved for prospecting. Exploitation rights, covering one-half the exploration area, are granted for 20 years, extendable another 20 years.

The government oil company, which operates two commercial fields, made a new discovery three months ago near Taipeh. CPC already has completed part of a scheduled seismographic survey, which is being executed by a Japanese company.

•

GREECE—International oil companies with marketing interests in Greece, as well as engineering firms, were among the 15 answering the Greek government's request for expressions of interest in running its projected refinery. Oil companies include Shell, Socony, Caltex, Petrofina, British Petroleum, and American Independent Oil Co.

The number is expected to narrow down considerably, however, when Greece clarifies its requirements. Original invitation specified only financial and technical capabilities for running a refinery and drew responses from oil firms marketing in Greece, as well as groups prepared to offer technical engineering services only.

Robertson M. Ford, president of Ford Associates, of New York, would make no comment on reports that Aminoil was working out a partnership arrangement with the group, presumably in connection with Aminoil's interest in operating the Greek refinery. Ford Associates, he said, was established seven months ago as a firm of international consultants to represent American interests abroad. Gen. James A. Van Fleet (retired) is a member of the board of the new firm.

The projected refinery, Greece's first, will be built in the Athens area for the Greek government by the

German affiliate of Hydrocarbon Research, of New York, together with three German engineering firms. Capacity will be about 26,000 b/d, and it is intended to supply Greek requirements only.

•

PERU—Ganso Azul Petroleum Co. has spudded in well No. 1 on Santa Clara concession near the Ucayali River about 10 mi. from Orellana. Ganso Azul, affiliate of Texas Gulf Production Co., Houston, recently became co-owner of the concession when it took over a two-thirds interest from Peruvian Oil & Minerals, a Canadian company. Site of the well is within several hundred feet of a well drilled to 1,100 ft. by Empresa Petrolera Fiscal and abandoned in 1948 because of mechanical difficulties.

•

THAILAND—The government has invited offers to build and operate a 5,000 b/d refinery about 6 mi. from Bangkok. The proposed refinery will be government-owned and will operate on Middle East crudes. Provisions in construction requirements include a jetty to accommodate tankers up to 12,000-ton capacity; storage for about 700,000 bbl. of crude and 560,000 bbl. of products; and transfer-line facilities to an existing bulk storage plant about 1¼ mi. from the refinery site.

•

UNITED KINGDOM—All of Shell's chemical manufacturing and marketing operations in the U. K. and Ireland will be concentrated in one company. In announcing formation of Shell Chemical Co., Ltd., Shell said the move would facilitate plans for further expansion in its chemical operations. Capital of the new company is set at £10-million ($28-million). Chairman of the board will be F. A. C. Guepin, and L. H. Williams will be managing director.

•

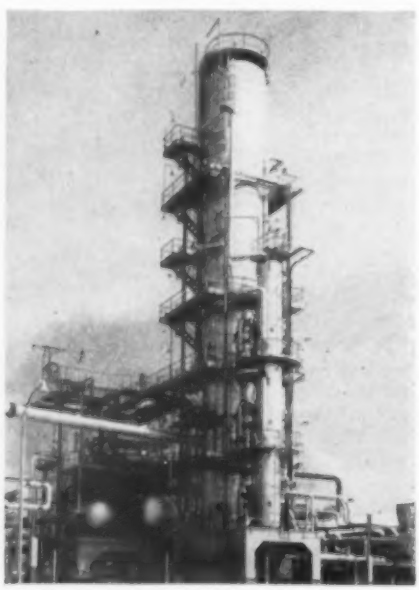
MEXICO—Socony Mobil's Mexican affiliate will begin compounding lubricating oils this week under a contract signed with Pemex last April. Howard Bird, president of Mobil Oil de Mexico, said operations would start in temporary facilities until a permanent blending plant is completed in mid-1956. Formerly called Cia. Comercial Vacuum, S. A., the company officially changed its name Aug. 1. It was the first to contract with Pemex for erecting of blending facilities after the Mexican government banned lube oil imports this spring. Quaker State has signed a similar contract, and Texaco is expected to follow suit shortly (PW—Jul.22'55,p29).

•

INDIA—M. W. Kellogg Co., of New York, is one of three foreign firms invited by the Indian government to submit project reports on a proposed synthetic oil plant. The others are Lurgi, of Frankfurt, and Heinrich Koppers, of Essen.

The government has just announced that it would accept the recommendations of its Synthetic Oil Committee as final. As a first step, the committee has recommended setting up a 300,000-ton plant (about 6,000 b/d) at a cost of $100-million. The government is now budgeting for the plant in its second Five Year Plan, which will be announced in October. The foreign firms' reports were requested by that date.

Critics of the project maintain that major oil strikes recently in Assam and Bengal may eliminate the need for the plant.



Pipeline, Refinery Expansions Mean More Oil for Mexico City

Crude oil supply for the Mexican government's newly expanded Atzcapotzalco refinery was boosted by completion last month of an 18-in., 100-mi. pipeline (left, above) from the Poza Rica fields in Veracruz. The line increases crude deliveries to the refinery from 45,000 b/d to 75,000 b/d. Another pipeline, scheduled for October completion, will further increase delivery to 90,000 b/d. Fractionator (right) at the Atzcapotzalco refinery is part of new facilities also inaugurated in July; these double the refinery's capacity to 100,000 b/d. The $15-million projects are part of Pemex's $100-million development program for 1955.

THE LORE OF OIL / By James A. Clark

When Oil Got Mixed Up with Encyclopedias

NEWS ITEM—The old Huntington Beach field in California is the scene of the state's greatest drilling activity this year. Since Jan. 1, some 200 wells have been drilled on about 85 acres. This puts Huntington Beach in the class with the Spraberry trend as a field that will probably never pay out for the operators.

* * * *

All of California's gain in the number of wells drilled so far this year can be attributed to the feverish activity at Huntington Beach, according to the statistics.

As a matter of fact, during the first five months of the year almost 200 wells were drilled on old "Bedlam Beach." Not only that, all 200 of them have been drilled on something less than 100 acres.

That means the operators are not making any money—even if they are having a lot of fun. For the royalty owners, though, it's another story. They invest nothing, so everything they receive is pure velvet. They don't do any exploring, or lease any land, or drill any wells, or build any pipelines, or anything else that costs money. All they do is wait for their royalty checks.

Anyway, Huntington Beach is much in the news today. And it is, I think, the locale of one of the most fantastic stories of petroleana (which means oil lore).

* * * *

It all has to do with the so-called Encyclopedia Lots. There are 420 of them, all told, and they were carved from 35 acres of steep hillsides and deep ravines.

Some time shortly after World War I, the Encyclopedia Britannica Co. came out with a set of Student Reference Encyclopedias in a dozen or so volumes. Someone hit on the idea that a good way to promote the books would be to give away beach lots in sunny California.

Huntington Beach was a setup for the deal. Its real estate boom had died out in 1905, and had gone from bad to worse in the meantime. So a Britannica agent named Valley O. Appel bought seven plots of five acres each, up and down hills and canyons, and cut them up into the 420 lots. The company paid $200 an acre, or $7,000 for the land.

Sales of the new volumes were hot and fast. By the time oil was struck at Huntington Beach in 1919, all except five of the lots had been given away with volumes of books. Of course, owners were scattered all over the country, since they had responded to direct mail and national advertising campaigns.

The discovery well was right on the edge of the lots the Encyclopedia Britannica agent had purchased. So when Standard Oil Co. of California discovered the field, the fortunate 415 purchasers of the reference books became potential royalty owners immediately.

The only trouble was that most of the book buyers didn't know they were oilionaires (some probably still don't know it). So some of them were delighted to receive letters from a syndicate, composed of a group of Huntington Beach businessmen headed by William Schumacher, offering to purchase their lots at from $5 to $15 apiece.

The syndicate had some $500 in the deal, and bought only 33 of the lots. Each syndicate member had put up only $100. For its investment in the 33 lots, the syndicate got a $2,500 lease bonus, and a one-sixth royalty. By the end of 1933, it had paid members more than $250,000. And new activity will probably boost that figure immensely.

When oil was struck, of course, the Encyclopedia Britannica Co. still held the remaining five lots. If the Britannica profited as well as the Huntington Beach syndicate, then it probably realized some $40,000 or more from these lots, in addition to any bonus for the lease.

* * * *

Immediately after the discovery of oil, a complicated lawsuit developed from the Encyclopedia Lots. Attorneys for the Encyclopedia Britannica Co. contended that the streets and alleys had not been given with the lots. The lawsuit was a bitter one. Finally there was a settlement. The Britannica received $2,500 but lost the streets and alleys—and with them a fortune.

* * * *

And that brings up the individual lot purchasers. There is no record available to me that indicates if all of them were ever found. Chances are several are still missing. If so, it is likely that their oil has been drained—unless some good, honest company has put their money in escrow through the years.

Assuming that all 420 lots got as good a deal as the Huntington Beach syndicate, 382 individual lot owners should have received more than $3-million. Each of the lots, through 1953, would have paid its owner some $8,000.

And now a new boom, possibly even bigger than the old one, is going on.

So, if there is anyone who bought a set of Student Reference Encyclopedias back in 1918 or 1919, and got a certificate for a lot that hasn't been cashed in, just head for Huntington Beach and retirement.

The Market Place

AROUND THE WORLD

Current key crude and refined oil prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service, a McGraw-Hill Publication.

All Prices as of August 8

*Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal., except dollars per bbl. where $ is shown)

Western Hemisphere

U. S. Gulf Coast, cargoes
- Basoline, 97 oct prem....13-13.5
- Gasoline, 90 oct reg....11-11.5
- Kerosine....8.75-9.75
- Heating oil, No. 2....8.5-9.25
- Gas oil, 48-52 d.i....8.625-9.125
- Fuel oil, bunker "C"....$2.10-2.15

Caribbean, cargoes
- Avgas, Grade 100/130....16.75
- Gasoline, 93 oct research prem....11.5
- Gasoline, 87 oct research reg....10.5
- Gasoline, 79 oct research....9.75
- Gasoline, 70-72 oct motor method....9.5
- Kerosine....8.75
- Heating oil, No. 2....8.5
- Gas oil, 48-52 d.i....8.625
- Fuel oil, bunker "C"....$2.10

New York Harbor, barges
- Gasoline, 89 oct reg....11.75
- Kerosine....10.55
- Heating oil, No. 2....9.8
- **Fuel oil, No. 6....$2.50-2.65**

Okla.-Group 3, northern shpt, bulk
- Gasoline, 86 oct reg....11-11.5
- **Kerosine....9.25-9.625**
- **Heating oil, No. 2....8.125-8.625**
- Fuel oil, No. 6....$1.75-1.90

Chicago, bulk
- Gasoline, 86 oct reg....12
- **Heating oil, No. 2....9.25-10.3**
- Fuel oil, No. 6, high sulfur....7.15-7.35

Los Angeles, rack
- Gasoline, 84 oct reg....11.75-12.1
- Stove dist., PS 100....9.25-10
- Diesel fuel, PS 200....8.75-9.25
- Light fuel, PS 300....$2.05-2.10
- Heavy fuel, PS 400....$1.70-1.85

Natural Gasoline, Grade 26-70
- FOB Group 3....5
- FOB Breckenridge, Tex....4.5

Penna. Lubes
- **Bright stock, 25 p. t....17.5-18**
- 200 vis. neutral, 25 p.t....18

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 vi....20-21
- Neutral, solvent, 200-210 vis....15.75-16.75

Gulf Coast Lubes
- **Bright stock, solvent 95 v.i....20-21**
- Neutral, solvent, 200 vis....15.75-17.5

**Sterling*

Eastern Hemisphere

Singapore, cargoes
- Avgas, Grade 100/130....18.125
- Gasoline, 79 oct research....10.25
- Gasoline, 70-72 oct motor method....10.00
- Kerosine....9.375
- **Gas oil, 48 d.i. minimum....9.125**
- Fuel oil, light....$3.10

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9 grav....$2.82
- North Dakota, 36.0-36.9 grav....2.82
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 grav....2.95
  - Gulf Coast, upper & lower, 26.0-26.9 grav....2.82
  - West Texas sweet, 36.0-36.9....2.82
  - West Texas-New Mexico intermediate, 36.0-36.9....2.75
  - West Texas—New Mexico sour, 32.0-32.9....2.61
  - East Texas, flat price....2.90
  - Mirando, 28.0-28.9 grav....2.96
- Illinois Basin, flat price....2.90
- Penna. Grade, Bradford dist., flat price....3.60
- California, Signal Hill, 21.0-21.9 grav....2.30†
- North Louisiana-Arkansas, 36.0-36.9 grav....2.82
- Wyoming sweet, 36.0-36.9....2.82
- Wyoming sour, 32.0-32.9....2.48

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.) D-2, D-3, L.C....2.54
- Leduc-Woodbend (Alta.) D-2, D-3....2.60
- Redwater (Alta.) D-3....2.49
- Daly-Mississippian (Man.)....2.34
- Smiley-Viking (Sask.)....2.24

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido....3.40
- San Joaquin, 41.0-41.9, Puerto la Cruz....3.04
- Oficina, 32.0-32.9, Puerto la Cruz....2.82
- Tia Juana Medium, 26.5-26.9, Amuay....2.30*
- Bachaquero, 16.5-16.9, Amuay, Las Piedras....1.80**
- West Tarra, 37.0-37.9, Cardon....2.99
- **Lagunillas Heavy, flat prices: Cardon....1.90**
- Amuay, Las Piedras....1.85

Differential per ½ deg. grav.: (*) 2.5¢ bbl. (**) 3.5¢ bbl.
†Differential per deg. of grav. varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabian, 36.0-36.9, Ras Tanura....1.97
- Basrah, 36.0-36.9, Fao....1.92
- Iranian, 34.0-34.9, Bandar Mashur....1.91
- Iranian, 34.0-34.9, Abadan....1.86
- Iraq, 36.0-36.9, Fao....1.92
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.72
- Qatar, 39.0-39.9, Umm Said....2.06

Middle East, E. Mediterranean
- Arabian, 36.0-36.9, Sidon....2.39
- Iraq, 36.0-36.9, Tripoli, Banias....2.39

Far East (Cargoes, FOB Lutong, Sarawak)
- Seria Light, 37-38 grav....2.60

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U. S. Gulf-New York, clean..(USMC −3¾%) $2.74
- **U. S. Gulf-New York, dirty....(USMC −10%) $2.57**
- NWI-USNH, dirty....(USMS −15%) $2.30
- **NWI-UK/Continent, dirty....(MOT +2½%) 33/4***
- **Persian Gulf-UK/Cont., dirty....(Scale +5%) 56/6***
- Persian Gulf-USNH, dirty....(USMC −55%) $5.72

**Sterling*

The Market Trend

Ocean Tanker Market Runs Strong

U. S. tanker charterers missed the boat in the ocean tonnage market this season. And when rates are headed for a $1.00-a-ton rise on 1,800-mi. voyages, missing boats can be an expensive proposition.

Domestic charterers this week were paying as high as $2.57 a ton (USMC minus 5%) for consecutive crude and bunker oil trips from Netherlands Antilles to New York. As recently as early July, they had tonnage in hand in this trade—and turned it down—at $1.58 (USMC minus 45%). When they were offered bottoms at that rate, they countered at USMC minus 55%. There were lots of tankers in the Caribbean, they figured. Owners would be getting jittery, grab at any bid.

But tanker owners didn't have to cut rates to get summer business. British charterers were waiting to pay their full offering price for Persian Gulf-U. K./Continent crude hauls. In fact, there has been insistent demand for tankers in London all this summer—a fact U. S. charterers didn't realize until too late.

Before the domestic companies knew it, they were bidding up prices for fall and winter voyages. First, they paid USMC minus 35% for consecutive voyages, Netherlands Antilles-New York, through September. Next, USMC minus 25% for consecutives through October. And last week, the following: through October, $2.30 a ton (USMC minus 15%); through December, $2.50 (USMC minus 7½%); through March, 1956, $2.27 (USMC minus 5%).

London demand for Persian Gulf loadings has pulled quite a few tankers away from the Aruba-New York route into eastern waters. If the supply dries up in the Caribbean, still higher rates for North-of-Hatteras voyages may be in the offing.

'C' Fuel—Another Increase: The East Coast got another residual price hike on Aug. 6. Esso Standard started the move, increasing 15¢ a bbl. on No. 6, 10¢ on No. 5, and 7¢ on No. 4. In mid-July (PW—Jul.22'55,p35), East Coast and Caribbean bunker "C" fuel prices hopped up 15¢.

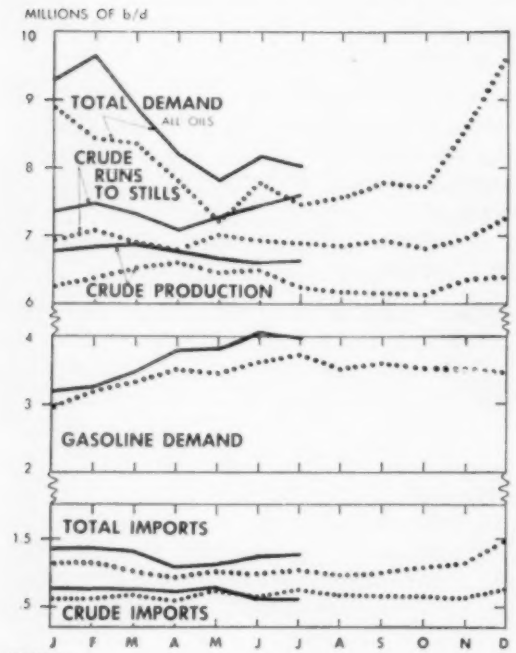
Gasoline: Up-in-the-inland and down-on-the-seaboard still is the order of the day in gasoline prices. In Oklahoma, Continental Oil Co. increased its tank wagon prices 0.5¢ a gal. But in eastern Pennsylvania, Atlantic Refining Co. cut by the same amount in five counties, including the city of Philadelphia.

Distillates: For the first time this summer, No. 2 fuel is starting to move into secondary storage. The reason: An East Coast price advance is believed imminent following the recent 0.25¢ jump in cargo prices at the Gulf. There's nothing like price-rise talk to start a reseller filling tanks—his own and his customers'.

Crude: A Shell affiliate in Venezuela has hiked two heavy crudes 5¢ a bbl., FOB Cardon. Its new price for Lagunillas is $1.90 flat, and $1.70 for 12.5-12.9 gravity for Bolivar District heavy.

PETROLEUM WEEK'S

Fingertip Figures



TOTAL DEMAND

Latest 4-week average	8.134
Year ago	7.511

RUNS TO STILLS

Latest week	7.542
Previous week	7.577
Year ago	6.744

CRUDE PRODUCTION

Latest week	6.540
Previous week	6.616
Year ago	6.153

GASOLINE DEMAND

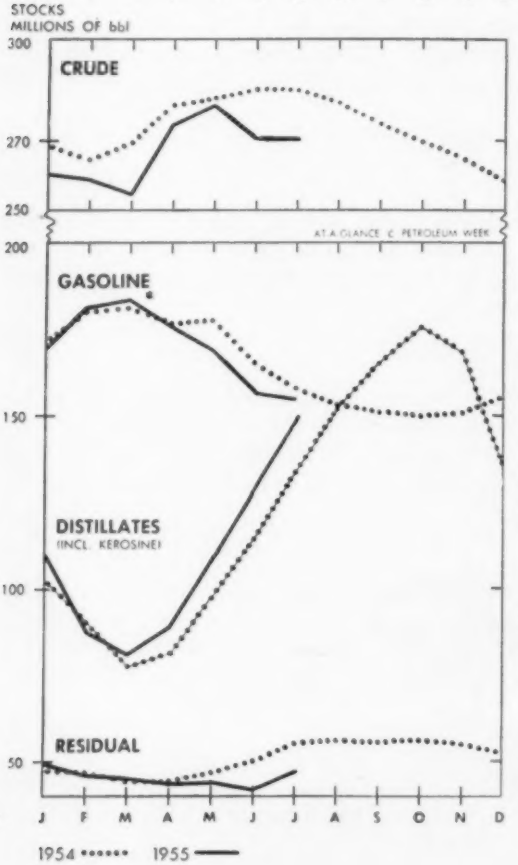
Latest 4-week average	3.929
Year ago	3.718

TOTAL IMPORTS

Latest week	1.013
Previous week	1.187
Year ago	1.000

CRUDE IMPORTS

Latest week	.891
Previous week	.864
Year ago	.657



CRUDE STOCKS

Week ending 7-30	269.1
Previous week	270.0
Year ago	279.8

GASOLINE

Latest week	156.5
Previous week	157.0
Year ago	156.8

DISTILLATES

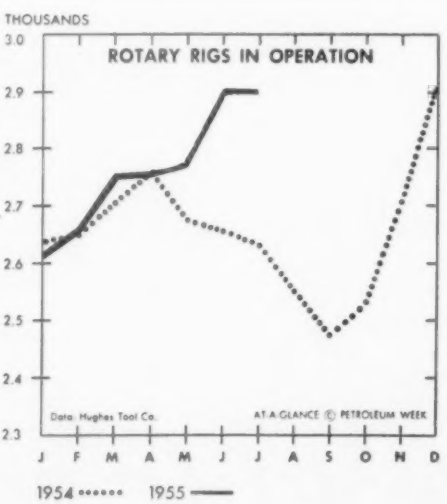
Latest week	152.0
Previous week	147.9
Year ago	137.6

ROTARY RIGS

Latest week	2,951
Previous week	2,899
Year ago	2,551

RESIDUAL

Latest week	45.3
Previous week	45.5
Year ago	55.2



TOTAL DEMAND for all oils in the four weeks ended Aug. 5 ran 8.2% ahead of the corresponding period of 1954, or slightly higher than the margin over a year earlier than has been maintained for most of this year. Demand for gasoline in this latest four-week period was 5.6% higher than the like period of last year.

The "oversupply" of distillates that everyone has been worrying about may not be so bad after all. Reason: Demand for distillates recently has been exceptionally strong. This is an important factor in the recent ¼¢ per gal. increase in the price of No. 2 heating oil on the Gulf Coast. Demand for distillates (including kerosine) in the four weeks ended Aug. 5 averaged 1,295,000 b/d, up 17% over the like part of last year. Inventories of distillates at the end of July were the equivalent of a 112-day supply, while a year ago there was a 120-day supply on hand.

The distillate stock build-up, however, will continue for another 8 to 10 weeks prior to the start of the heating season. And some industry sources estimate that the recent high rate of refinery runs may yet result in an oversupply of heating oil stocks prior to fall. Actual runs to refineries have been in excess of 7.5-million b/d since early June. The Bureau of Mines had forecast required runs in July of only 7,250,000 b/d. For August, the bureau estimates required runs at 7,290,000 b/d.

GATHERING INFORMATION in the field (left) or reporting back to his boss, Wiley Wagner Wiggins illustrates the fact that . . .

An Oil Scout's Life Is a Hectic One

Like newspaper reporting, oil-field scouting gets in your blood. You've got to be on the ball, have a nose for news, and a knack of getting information that just isn't there.

The oil scout's job is to get all the facts on every well drilled or set to be drilled in his territory. This includes his own company's wells and wells of every other operator, big or small. Not only must the scout have all this information at hand immediately for his company's officials, but he must be able to anticipate drilling plays. He must also keep an eye on lease prices, and general trends.

Wiley Wagner Wiggins, scout for Atlantic Refining Co.'s East Texas district, has been in the scouting game for 19 years. He chose between a government job and an oil-company scouting job during the depression in 1935, and joined Phillips Petroleum Co. at Bartlesville, Okla., as a draftsman. He got $135 a month, the same amount the government would have paid him. But Wiggins felt he'd be better off working for an oil company.

He stayed with Phillips for two years, then moved to Dallas in 1938 to take a job with Atlantic Refining Co. as a senior map draftsman in the geological department.

Wiggins spent six years in this capacity, and was then shunted over to Tyler, in East Texas, in November, 1944, as a district scout.

Wiggins sometimes has to be in three places at once. Since this is impossible, he "cooperates" with other scouts in his district. In other words, he trades his information for that of other scouts.

All of the scouts from the various oil companies and independent operators in Wiggins' territory meet every week. This get-together is called a "checkmeet," where information is swapped. Oil companies know their scouts can't possibly be everywhere at the same time. Since this business of drilling moves so fast, the trading of information is an accepted practice with everybody.

In Wiggins' district, which is centered in Tyler, there are about 46 counties to be covered. Thirty-three oil companies maintain scouts in this district to keep in touch with all that's going on in leasing and drilling. But even with the weekly scout "checkmeets," adequate information is not always available.

Scouting is no easy job. Wiggins is subject to 24-hour call, and averages 2,700 mi. of driving a month. East Texas is big territory and its operations are far-flung.

Here's his typical work week:

- Monday and Tuesday: Wiggins "makes" his district, talking to drillers, checking various records for leasing information, trying to get a whiff of trends.
- Wednesday: He gets together in the Blackstone Hotel in Tyler for the East Texas weekly checkmeet. By the time the scouts get through swapping information and chewing the fat, Wiggins—and each of the other scouts—has a clear, concise report of the overall picture of the district to submit to his company.
- Thursday: Wiggins uses this day to catch up on his office work, and types up his detailed well reports to be sent to the home office. Sometimes a hot well will throw him off schedule here, and he has to take off again on a checking spree.
- Friday: Back to the field again for further checking. Maybe by Friday a well that was started on Monday or Tuesday has been completed or abandoned. Drilling crews in East Texas move pretty fast, because digging's easy and wells are shallow.

And often the need to run down a hot tip somewhere cuts into Wiggins' weekend.

Getting dope on tight holes can be a problem, but a good scout says there's no such thing as a "tight hole."

There are various ways for an experienced scout to get his information. Tight-hole data are always released eventually, but, as Wiggins says, "there's nothing more important in a new oil play than information." So, early geological data, drilling-penetration rates, other facts are an absolute must.

Each tight hole poses its own special problems. On one such well in Marion County, scouts in East Texas had to do some spying: In order to

CLASSIFIED

DISPLAYED RATE

The advertising rate is $12.60 per inch for Equipment and Business Opportunity advertising appearing on other than a contract basis. Contract rates quoted on request.

Employment opportunities—$14.80 per inch, subject to Agency Commission.

UNDISPLAYED RATE

$1.50 a line. Minimum 3 lines. To figure advance payment count 5 average words as a line. (See ¶ on Box Numbers.)

POSITION WANTED. Undisplayed rate is one half of above rate, payable in advance.

PROPOSALS, $1.50 cents a line an insertion.

INFORMATION

BOX NUMBERS count one additional line in undisplayed ads.

NEW ADVERTISEMENTS accepted 16 days prior to issue date.

OPPORTUNITIES
in Petroleum Sales

Expansion program provides real opportunities for life-long careers with well-known refining and marketing oil company. Prefer engineering or chemistry background together with experience in sales of gasolines, lubricants, naphthas or distillate fuels. Age 25 to 35, travel. Replies treated confidentially. Write Deep Rock Oil Company, P. O. Box 1051, Tulsa, Okla.

PETROLEUM MEN

An active, confidential service!
Interview at your convenience.
Call, write or wire
GLADYS HUNTING (Petroleum Division)
DRAKE PERSONNEL, INC.
220 So. State St., Room 628, Chicago 4, Ill.
HArrison 7-8600

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITION VACANT

Engineer or Chemist, for sales position with a national organization. Selling experience desirable but not necessary. However, must have experience in the petroleum refining industry. Please reply to P-7271, Petroleum Week, giving age, experience and salary requirements.

SPECIAL SERVICE

Oklahoma Oil and Gas Lease and Royalty Buyer. Have served major and independent companies and individuals in Oklahome for over 35 years. Refer to any local bank, and will furnish list of principals on request. Henry O. Brendle, 106 North Peters, P. O. Box 405, Norman, Oklahoma. Telephone 2339.

WANTED

ANYTHING within reason that is wanted in the field served by Petroleum Week, can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

get the information they needed, they sent small boys, to the rig floor, to check various gauges. They could go there because it was on their farm. This worked swell for several days, but the driller soon got wise. His method of stopping this juvenile espionage was simple: He told the boys to stay away from the rig, or he'd cut off the flow of natural gas from the well to their farmhouse. This would mean "back to the woodpile" for the boys. It worked.

A scout has many other important duties. Among them: Obtaining confidential electrical logs on wildcat wells, and determining if oil-lease brokers are pounding the area. If so, the scout must find out what they're buying and what they're paying for it. Also, the scout must keep an eye out for geophysical activity in the area. If any shows up, this means some company or operator is probably planning a drilling program.

Wiggins' status as a scout gained added luster recently when he was honored with the presidency of the National Oil Scouts & Landmen's Assn. His election came at the 32nd annual convention at Banff, Alta.

Wiggins has always taken a hand in local scouting affairs. He says scouting "is the best job in the oil patch." He admits the pay of a scout doesn't run as high as some of the highly specialized jobs in the business, but the other things that go to make it an enjoyable job make up for it.

Wiggins has attended every annual convention of NOS&LA since 1946. He served on the editorial committee of the Scouts' year book in 1945, which covered a review of 1944 activity, and also served as editor on the association's year book for the East Texas District in 1946. He was named first vice-president of the East Texas group in 1949 and president of the group a year later. He's been an official delegate to the national association meeting ever since 1951.

Wiggins is a native of Trinity, Tex., and attended high school in Sinton. He graduated from Abilene Academy in 1925 and later went to Abilene Christian College. He took further training at Texas A & M College, specializing in architectural drawing and oil gas law. He later studied leases and land titles at Tyler Junior College.

•

LOWELL N. APPELGATE has been named assistant vice-president in charge of production for Falcon Seaboard Drilling Co., Tulsa. The firm operates 27 rigs in six states. Appelgate was assistant reservoir engineer for the Gulf Coast area for Phillips Petroleum Co., at Bartlesville.

HARRY A. GIBBON will coordinate exploration and production activities of Standard-Vacuum Oil Co. throughout the Eastern Hemisphere. He will have his headquarters in New York City. He will be assisted, in his newly created office as producing coordinator, by **Albert Wright, Jr.**, former assistant general manager of Standard-Vacuum Petroleum Maatschappij (SVPM), the company's Indonesian affiliate. For the past two years Wright has been with International Petroleum Co., Ltd., at Coral Gables, Fla. Gibbon has been Stanvac's regional coordinator for southeast Asia, prior to which he was the firm's coordinator for Indonesian affairs in the New York office. While its present crude oil production is limited to Sumatra and western New Guinea, the company is engaged in a wide search for oil in Australia, Papua, India, Pakistan, and British Somaliland, with plans for pushing this search to the Philippines.

JOHN I. RICHARDSON is the new district representative in the Cincinnati office of the American Petroleum Institute's Oil Industry Information Committee. He replaces **Richard H. Robinson,** who resigned recently. Richardson, with API five years, will work with **J. W. Lenon,** senior district representative in the Kentucky-Ohio-Tennessee district. Richardson was in the Minnesota-Dakotas district, working out of Minneapolis.

CLERMONT CARTWRIGHT has been elected a director of Sunset Oil Co., Los Angeles. He is chairman of Hill, Thompson & Co., New York investment bankers.

MYRON C. KIESS has been named geological manager of the exploration department of Sunray Mid-Continent Oil Co., Tulsa. He was chief geologist of Mid-Continent Petroleum Corp. before the firm merged with Sunray Oil Corp. to form the present company. His new title is the result of now-completed expansion, re-alignment, and integration of the exploration departments of the previously separate firms. **Stefan Von Croy,** former Sunray division geophysicist, is now chief geophysicist of

the combined departments. **Sherril A. Shannon** and **Bert C. Timm,** former Sunray division geologists, have been promoted to assistant chief geologists. **Thomas A. Clote** and **Joe S. Peerson** will serve as division geologists. **Fred Phelps,** senior research geologist, and **Dave Jewell,** assistant to Von Croy, round out Sunray Mid-Continent's main office geology staff. **J. Q. Tomkins** will be district geologist in charge of a new exploration office in Salt Lake City. **E. L. Smith** is district geologist in the new office in Wichita Falls.

S. W. TOTTEN of Jackson, Miss., has been appointed exploration manager of The California Co.'s western division, Denver. **C. H. Ramsden,** who held the Denver position, succeeds Totten at Jackson.

W. M. OSBORN and **JOHN T. MILLER,** former officers of El Capitan Oil Co., of Midland, Tex., have formed a partnership, Osborn & Miller. The firm offers services in consulting, property management, lease and royalty trading, and drilling arrangements. Osborn, a geologist, was president of El Capitan for a year before he resigned to form the partnership with Miller. The latter was El Capitan's secretary-treasurer. El Capitan will cease active operations.

WILLIAM B. THRELKELD has been appointed director of the land and lease department of Texas Gas Transmission Corp., Owensboro, Ky. He succeeds **John W. Polkinghorn,** who retired last week after 26 years of service. Threlkeld has been assistant director of the department since January, 1951. He joined the pipeline department of Texas Gas in 1949, after 13 years service with the light, gas, and water division of the City of Memphis. In addition to his new title as land and lease director, he's been named assistant secretary of Texas Gas. **Louis S. Arrington,** senior geologist for the firm, has been named supervisor of geologists. **Alfred E. Little,** senior gas supply engineer has been promoted to supervisor of proration. **Robert D. Northcutt,** senior gas supply engineer, has advanced to supervisor of reservoir engineering.

FREDERICK W. DITTUS has been promoted from chief engineer to assistant vice-president of California Texas Oil Co., Ltd. He started with Standard Oil Co. of Calif. in 1916, and between 1935 and 1937 he was in Europe, directing procurement of all construction materials for the firm's Bahrain refinery. He has supervised construction projects for the Caltex group all over the world since that time. He has been chief engineer since 1944. **Robert R. Tillotson,** a veteran of 35 years with Caltex and Standard Oil Co. of Calif., has been named managing director of Caltex Oil Refining (India), Ltd. The latter firm will operate the new Caltex refinery being built at Visakhapatnam, India. **Arthur Benson Brown,** former President of Richmond Oil Co., Lima, Peru, has joined Caltex as managing director of Caltex Pacific Petroleum Maatschappij, with headquarters at Djakarta, Java. He was with Richmond 25 years. Serving with him at Djakarta, as deputy managing director of CPPM, will be **Robert N. Harding,** another newcomer to Caltex. Harding spent the past 18 years in exploration work for The Texas Co., where his most recent position was that of superintendent of the firm's Northern Foothills project in Calgary, Canada.

J. R. VANDEVER will manage the newly formed property acquisition department of Sunray Mid-Continent Oil Co., Tulsa. He was manager of joint operations for Sunray Oil Corp. when it was merged recently with Mid-Continent Petroleum Corp.

LE ROY H. HINES, a petroleum consultant, has been elected a director of Oceanic Oil Co., Los Angeles. He is a former assistant to the vice-president of Standard Oil Co. of California and a former vice-president of the Northern Pacific Railway Co. He replaces **Melvin H. Lockett** on the Oceanic board. Lockett resigned recently.

ALLEN B. HIATT has left Phillips Petroleum Co., after 25 years of varied experience in the natural gas and natural gasoline industries, to become assistant to the president of Pacific Northwest Pipe Line Corp.

ADVERTISERS IN THIS ISSUE

This index is published as a convenience to the readers. Every care is taken to make it accurate, but PETROLEUM WEEK *assumes no responsibility for errors or omissions.*

Beaird Co., Inc., The J. B. 13, 14
Dowell, Inc. 4
Dresser Engineering Co. 25
Lone Star Steel Co. 22
National Aluminate Corp. 7
Republic National Bank of Dallas 3
Roebling's Sons Corp., John A. 2
Scientific Design Co., Inc. ..... 4th Cover
Texas Co., The 32
Universal Oil Products Co. ..... 2nd Cover, Page 1
Vector Mfg. Co. 31
Watson-Stillman Fittings Div., H. K. Porter Co., Inc. 8
White Motor Co., The ..... 3rd Cover

CLASSIFIED ADVERTISING
F. J. Eberle, Ass't Mgr.

EMPLOYMENT OPPORTUNITIES 42
SPECIAL SERVICES 42

PETROLEUM WEEK REPRESENTATIVES

Atlanta 3
Stokes T. Henry
801 Rhodes-Haverty Bldg.
Walnut 5778

Boston 16
Edward A. Callahan, Jr.
350 Park Square Bldg.
Hubbard 2-7160

Chicago 11
G. L. Hackley, Jr.
W. F. Holbrook
520 North Michigan Avenue
Mohawk 4-5800

Cleveland 15
J. E. MacArthur
1510 Hanna Bldg.
Superior 1-7000

Houston 25
David G. Sawyer
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17
Knox Bourne
1111 Wilshire Blvd.
Madison 6-4323

New York 36
Edward A. Callahan, Jr.
Donald R. Thompson
330 West 42 Street
Longacre 4-3000

Philadelphia 3
W. A. Potter
Architects Building
Rittenhouse 6-0670

San Francisco 4
T. Evans Wyckoff
68 Post Street
Douglas 2-4600

Tulsa 19
J. A. Hartley
Room 309, 611 South Boston
Gibson 7-7767

Hitching the Atom to Oil

OIL'S USE OF THE ATOM now is entering its most significant phase, with three companies willing to bet millions that it can be harnessed as a process tool of boundless potentialities in the field of petroleum refining.

For quite some time the oil industry has been the leader in industrial use of radioactive byproducts of atomic energy in meeting its problems. It's been the biggest user, in fact, of nuclear isotopes. There's hardly a phase of petroleum and petrochemical research in which isotopes aren't employed today. One company alone has from 20 to 25 applications of isotopes as a research tool. And they are being increasingly adapted for usage in actual industry operations, to perform such workaday functions as that of signaling the approach of an interface slug in a products pipeline.

NOW, HOWEVER, BEGINS the really big test of the atom in terms of what it can contribute to the advancement of the petroleum industry.

Basically, as our story on page 11 relates, Atlantic Refining, Jersey Standard (through Esso Engineering & Development), and Socony Mobil are all out after the same thing, in their separate approaches to kinds, of chemical reactions as compared with those that are possible in present refining processes. No one can safely guess where their research —and that of the other companies that will surely be launching similiar ventures before very long—might lead them, what they might wind up with. But one thing is fairly certain. That is that changes ARE COMING in petroleum refining as it's known today.

MAYBE THOSE CHANGES won't amount to more than a speeding up of some of the present refining processes. Yet there's also the distinct possibility, as suggested by Atlantic's research chief, H. W. Field, that "atomic radiation may prove to be the next step in petroleum processing."

And, if that happens, then possibly within another decade we may even be hard put to recognize a refinery by its outward physical appearance.

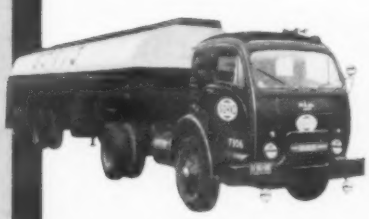
Here's a NEW LOOK that you Measure by the Work it Does... the Amount it Saves!

3000 Gallons for this WHITE 3000!

This Model 302264 has 3000 gallon tank for extra fuel oil deliveries . . . in-town gasoline trips.

SOHIO WHITES Boost Tanker Payloads Too!

Here is one of the Sohio tank-trailer units with White 3000 Tractor. Tanker holds 6300 gallons, has special payload undercarriage.



THERE'S more than meets the eye on this "new look" at Standard Oil of Ohio!

There's more work . . . greater efficiency . . . because these handsome, new Whites are really tailored to the exact work they do in delivering Sohio products.

Payloads were substantially boosted through creative engineering and by utilizing the exclusive design advantage of the White 3000. Exact truck specifications were developed to get maximum usefulness on the job . . . rugged six-wheelers for the big fuel oil loads . . . big payload tankers for heavier tractor service.

It's a *new look* that really pays off. Why don't you critically examine your own truck operations this same way. Call in your White Representative. He'll be glad to work with you!

THE WHITE MOTOR COMPANY • Cleveland 1, Ohio

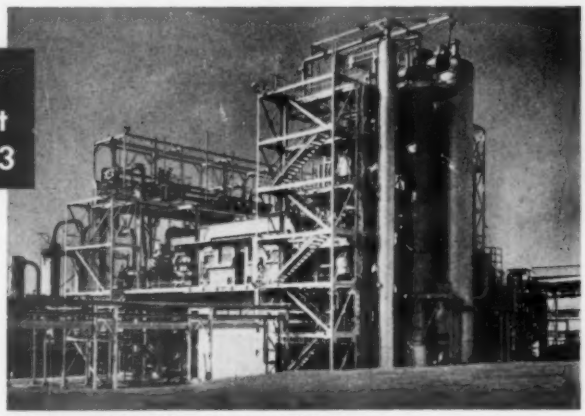
White 3000

FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

NEW DEVELOPMENTS

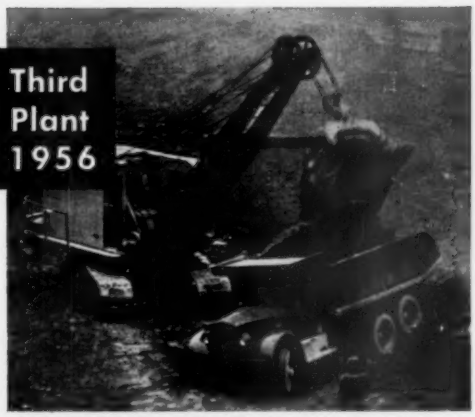
3rd Ethylene Oxide Plant To Use SD's Direct Oxidation Process

First Plant 1953



Naphtachimie Plant Lavera, France

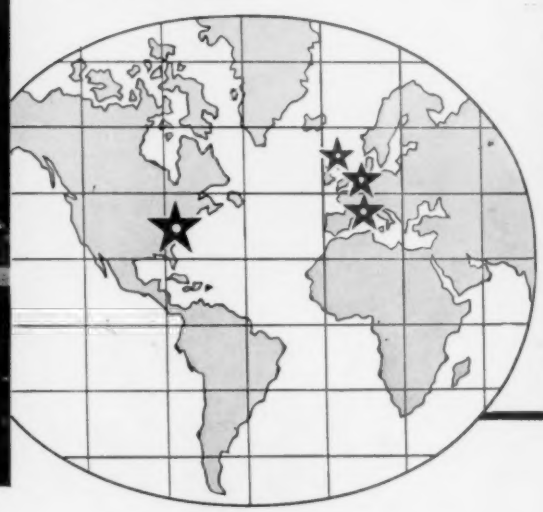
Third Plant 1956



Societé Chimique des Derives du Petrole Antwerp, Belgium

"We knew from our laboratory work in America that ethylene oxide could be produced at a lower cost by our direct oxidation process. Our pilot plant work in England proved it," says Dr. Robert Egbert, SD's Vice President of Engineering.

Dr. Philip Newman, SD's European Representative, says, "Our transatlantic experience in adapting standards of various countries to SD's process resulted in greater flexibility of design, as well as continued improvement of the process."



SD's "International Exchange" Pays Off

So far the payoffs have been in Lavera, France, and the United States. Next year SD crosses the Atlantic again for Societé Chimique des Derives du Petrole's new ethylene oxide and ethylene glycol plants in Antwerp, Belgium.

The less expensive direct oxidation process used in these ethylene oxide plants was developed in SD's American headquarters laboratories and put in pilot plant operation in England.

Naturally, there were many problems in "translating" data—both from pilot plant to commercial production and from foreign engineering practices to American standards. SD's international experience in ethylene oxide also provided the background necessary to solve these problems of "translation" in chloromethanes, citric acid and maleic anhydride processes.

Today, American companies can take advantage of the continued "international improvement" of SD's lower cost process of direct oxidation of ethylene.

On this or any other organic chemical plant design problem, SD's services are available to you on a confidential basis. In new plant construction or the revamping of existing facilities to increase production efficiencies, you will profit by utilizing SD's specialized experience in organic chemicals plant design.

SCIENTIFIC DESIGN COMPANY, INC.

Executive Offices:
Two Park Avenue
New York 16, N. Y.
Engineering Offices:
Jersey City, New Jersey